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January 31, 1949

STEEL

The Magazine of Metalworking and Metalproducing

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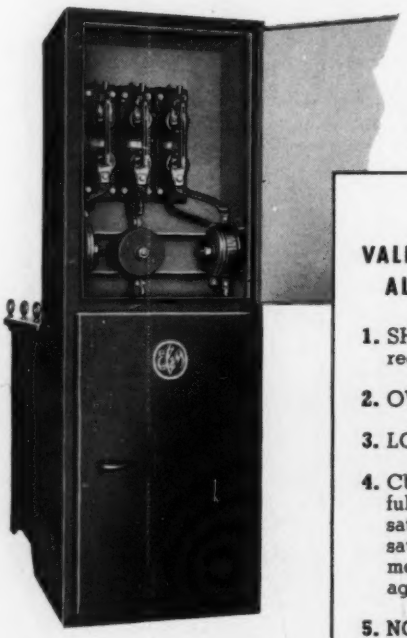

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Behind the Scenes...

From the Mailbag

Among the many comments from you good folks who have joined the ranks of 205th readers of this colyume were a lot that we'd like to acknowledge here in print. Can't possibly run them all, but we're going to single out a few. J. L. Drake, of L-O-F Glass Co., in Toledo, for example, for his sincere comments on our Christmas poem; Laurence McKinney of James McKinney & Son, who claims that reading this column makes him a different man (he doesn't say whether it's for better or for worse); Carl Schmock of Uniflow, up in Erie, who hopes our certificate of readership isn't a scheme to determine if there really are 205 readers of the column (which it is most definitely *not*); D. A. Wilson, of Canadian Westinghouse who believes there are that many readers behind the name that means everything in electricity; and a host of others. All of you by now should have received certificates as promised; they're free to anyone who wants to have one. All you have to do is drop us a line, claim to be the 205th reader, and we'll send you one.

Double Reading

We have for some time now, about 40 or 50 years, to be exact, had as one of the duties of the editoral staff the reviewing of the *Patent Office Gazette,* looking for new developments which might turn out to be story leads. Not until just recently, however, did we discover that the practice was reciprocal. Seems that down in the Patent Office they read STEEL, and check for information pertinent to current patents. The way we found out was that a Chicago inventor told V. G. Brettman, who sells space out in that area. Seems that he had been having a little argument with the patent office over a welding device he had perfected. It was a complicated machine, and there didn't seem to be complete understanding on the part of the Patent Office as to just what this machine was and what it would do. At about the time the discussion was going on, our editors ran the story of this particular machine. The inventor went to Washington shortly thereafter for a final plea on what looked to be a lost cause, and found to his amazement that the Patent Reviewer had the complete story from STEEL on his desk, and had appended it to all their papers. Instead of a couple of days of futile argument, only a few hours were required for complete approval of the patent because of the clear way in which our editors had marshaled their facts.

A Half Century Back

The formation of the great combinations still held most of our editors' attention in Volume 32, No. 5, fifty years ago. The American Tin Plate Co., was having some difficulties, one of which was the tremendous accumulation of mail during the period of formation. By Feb. 1 all this had been forwarded to Chicago for handling. Also, the West Coast manager had finally arrived at his new office, and business was about to get under way. John W. Gates was elected chairman of the newly-formed American Steel & Wire Co., and certain blast furnaces of the National Tube Co., were turning out as much as 400 tons of iron per day!

Double Reinartz

Leo R. Reinartz, whose article on open hearth steel production goes into its third instalment in this week's book, hit our editors twice last week. In addition to the open hearth article, Mr. Reinartz claimed some space in the news section when he told the Institute of Scrap Iron & Steel some bare facts about the scrap shortage and what they ought to do about it. And while we're on the subject of last week's book, if you were interested in the Military Purchasing Guide on page 31 but don't want to tear up your copy, we have a few extra copies available we'd be glad to send you.

Puzzle Corner

We are going to collect some mathematical problems and puzzles for appearance in forthcoming issues. Hope we can locate some real difficult ones to try your mathematical abilities; in the meantime, however, we're presenting a couple of easy ones for warm-up purposes. Like the one about the natives on Kokomumu Island, who will trade 2 spears for 3 fishhooks and a knife, and will give 25 coconuts for 3 spears, 2 knives and a fishhook. How many coconuts will they give for each item?

Shrdlu

(Editorial Index—page 19)

STEEL

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ROLL NECK BEARINGS

January 31, 1949

Play The Ace!

Those who studied President Truman's inaugural address are wondering what he meant by his "bold new program" to utilize this nation's scientific and industrial "know how" on a world-wide basis.

After stating that more than half the people of the world are living in conditions approaching misery, he said that "we should make available to peace-loving peoples the benefits of our stores of technical knowledge in order to help them realize their aspirations for a better life. In co-operation with other nations we should foster capital investment in areas needing development. Our aim should be to help the free peoples of the world, through their own efforts, to produce more food, more clothing, more materials for housing and more mechanical power to lighten their burdens. . . . With the co-operation of business, private capital, agriculture and labor in this country, this program can greatly increase the industrial activity in other nations and can raise substantially their standards of living. . . . All countries, including our own, will greatly benefit from a constructive program for the better use of the world's human and natural resources."

If, from this sketchy outline, the President envisions a broader opportunity for American techniques to play an important part in world development, then his proposal simply formalizes a trend that has been underway for decades. Any postwar world traveler knows that the prestige of American industry, which had been increasing steadily for a half-century, was given a tremendous new boost in almost every corner of the world because of achievements in World War II. Every nation with industrial potentials is thirsting for American technical literature, engineering services and equipment.

Therefore, it is not too fantastic to hope that this universally recognized asset of our nation can be employed to attract under-developed nations to us and away from Russia. She has no comparable "know-how" to offer as an inducement.

Our nation can accept Mr. Truman's idea without spending any great amount of money. All the government needs to do is to train its State Department officials in foreign countries to work with and not against the thousands of American engineers and business men who are abroad because foreign countries have sought their assistance.

* * *

KEEP FINGERS CROSSED: Seldom has it been more difficult to appraise business prospects than at the present time. One encounters contradictions wherever he looks.

Last week the president of the world's largest manufacturer of automobiles declared that he saw the possibility of a 6,000,000-car output in 1949. This would be an all-time record. Meanwhile, motordom was assembling 120,000 units per week, which is at the annual rate of six million, in spite of model changeovers.

At about the same time the largest steel producer in the world was declaring an extra dividend and splitting its common stock three for one. Meanwhile the American steel industry, operating at 100 per cent of capacity, for the second consecutive week broke all-time records of production. Concurrently, many of the orthodox barometers of business reflected a fairly healthy state of affairs.

However, behind the optimism of these statistics were growing evidences of economic adjustments throughout many segments of the metalworking industries. The pipelines of dis-

(OVER)

tribution had been filled and in the case of some products the one-time attractive backlog of orders had melted to negligible proportions almost overnight.

How far will this shake-down go in the near future? Is the apparent big backlog of steel orders legitimate or is it heavily inflated?

The answer is important. A really serious slowdown would prompt the leftish back seat drivers in Washington to press for additional government spending to "take up the slack." This is a time when a sound-minded opposition in Congress can render the nation a priceless service. —pp. 27, 28, 33, 46

* * *

REDUCES GRINDING HEAT: In surface grinding hardened steel the primary purpose of the coolant is to keep the heat generated by grinding as low as possible. When the coolant is applied by conventional methods, it arrives at a spot just behind the point where the grinding action takes place. Hence there is a sudden rise in temperature in the work followed by a sudden shock quench. This sequence can result in surface cracks, warpage or skin softness.

"Cool grinding" is a term applied to a new method of distributing the coolant. The coolant flows by gravity through V-grooves in the collector ring and into the wheel just outside of the lead bushing, whence it is flung by centrifugal force to the periphery of the wheel where it cools the work at point of contact. Tests show that from 200 to 500° F less heat is generated in "cool grinding" than by conventional wet grinding.

This reduction may seem small, but in many cases it is enough to prevent surface cracks and other difficulties. —p. 56

* * *

DIFFICULT BARGAINING: If the Consumers' Price Index of the Bureau of Labor Statistics continues to decline, as it probably will, unions whose fourth round of wage negotiations are scheduled for next May, June or July will find it difficult to make a case for increases in hourly wages. Undoubtedly their demands will center upon pensions, insurance, hospitalization and similar benefits.

This will inject unprecedented complications into collective bargaining, which already is a complex procedure. To develop a full fledged security plan that unions and employers can agree upon will entail studies and hard work extending over a long period. Important also is the question of how much more the consumer will be willing to pay for goods to enable the supplier to pay for these benefits to his employees. —p. 28

* * *

INCOMPATIBLE WAGES: There are several interesting angles to the case of the Waltham Watch Co. One is the manner in which the federal government, private banks, employees and the public are rallying to help the company out of its difficulties. A tentative reorganization plan is being considered in which Reconstruction Finance Corp. would lend $5 million, $1 million would be raised by bank loans and $3 million in equity financing would come from union employees and the citizens of the community.

Another point of interest is the fact that the heavy importation of Swiss watches has contributed to Waltham's troubles. Concurrently, Cleveland city officials who opened bids for two turbogenerators for a municipal light plant found that the $1,140,000 bid submitted by a European firm was $321,000 below that of the lowest of three American bidders.

Bridging the gap between American and foreign wage levels is going to be a difficult problem. —p. 29

* * *

BUSINESS HAS RIGHTS: Chances are good that the bill introduced by Sen. Edwin C. Johnson to clarify the existing uncertainty as to the legal status of delivered prices will be favorably reported by the Senate Committee on Interstate & Foreign Commerce.

In testifying that "obviously some clarification is desirable," Secretary of Commerce Charles Sawyer declared that "under American concepts of free enterprise, the decision as to what form of pricing practice to follow—subject to restrictions with respect to conspiracy, coercion, discrimination and other unfair practices—should be left to the judgment of individual business enterprises made in the light of market conditions."

This sound statement of policy, coming from a member of the President's cabinet, should carry some weight. It remains to be seen how the avowed anti-business senators will regard the Johnson bill when it comes up for debate. —p. 30

E. L. Shaner

EDITOR-IN-CHIEF

News Summary

BARGAINING COMPLICATED—Labor contract negotiators for metalworking companies are facing a tougher job this year (p. 28). The shift in union demands from straight wage increases to social insurance and pension benefits brings up the problem of figuring costs on the social security plans. These will vary greatly from company to company, depending on size, age of employees and other factors. Refiguring of costs, at best a complicated job, may be required many times during the negotiations as the offers and demands for benefits change in amount . . . . Meanwhile, the union's program for an annual wage received a boost in a bill introduced in Congress calling for such wage plans in plants of government contractors under the Walsh-Healey Act (p. 29).

PRESSURE EASING—Reduced operations in the lighter metalworking lines are being reflected in spotty easing in demand from these companies for warehouse steel (p. 27). Some jobbers report demand is off as much as 20 per cent; others say demand still exceeds supply. The majority notes a new consciousness of a more highly competitive market.

PRICING—Approval of the Johnson bill, to clarify the legality of freight absorption and the general confusion surrounding pricing policies, by the Senate commerce committee appears certain (p. 30). Among those advocating the measure is Secretary of Commerce Sawyer . . . . Federal Trade Commission's move to regulate quantity discounts is not expected to affect the quantity extra system in sales of steel products (p. 30).

STEEL EXPANSION—More than a half billion dollars were expended by the steel industry to expand its facilities during 1948 (p. 30) and an even larger amount will be spent this year. By the end of 1949, postwar expenditures for expansion will aggregate more than $2 billion and ingot capacity will be raised to 98.3 million tons . . . Meanwhile, a small but determined group in Washington is pressing for government participation in further steelworks expansion by means of loans or investments (p. 34).

RESEARCH CENTER—General Motors has reactivated its $20 million technical center (p. 41) and construction will start soon on a 350-acre site near Detroit. Project will be purely a fact-finding and experimental development activity, with no direct responsibility to the corporation's manufacturing divisions.

FOREIGN—Competition for steel business has reappeared on the Continent with the result of some easing in prices (p. 37) . . . Belgian foundries and some other industries are paring their payrolls because of lighter export demand . . . . Tightening of credits in western Germany has slowed business, particularly in construction and the heavy industries . . . India plans to spend $500 million in the United States during the next three years; bulk will go for capital goods.

HERE AND THERE IN INDUSTRY— Republic Steel Corp. has reached capacity production of 24-inch, high-pressure, fusion-welded pipe at its Gadsden, Ala., mill (p. 32), soon will start production of 30-inch material . . . Machine tool sales, long lagging, have turned upward (p. 32) . . . Steadily increasing freight rates may defeat their own purpose, warns (p. 39) the Interstate Commerce Commission . . . . General Motors research laboratories are providing high-compression engines to the petroleum industry to aid research in the development of high-octane gasolines (p. 41) . . . Employees of Waltham Watch Co. are helping raise equity capital in a refinancing program to permit the company to continue operations (p. 29) . . . Taylor-Wharton Iron & Steel Co. and Weir Kilby Corp. will combine (p. 44) . . . Briggs Mfg. Co. has bought a plant in Youngstown from Carnegie-Illinois Steel Corp. and will start stamping operations there this spring (p. 45); earlier, Briggs was reported considering establishing a plant in Pittsburgh . . . . Prices continue to ease downward (p. 46), the BLS wholesale average for all commodities dropping 0.7 per cent in the latest week and standing 4.3 per cent below this time last year.

Engineering News, p. 55 *Market Summary, p. 103*

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STEEL
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Warehouse Pressure Easing

Steel demand continues in excess of distributors' ability to satisfy, but new inquiry is off, reflecting seasonal lag and slowing down in light manufacturing lines

CUTBACKS in the lighter metalworking lines are beginning to be reflected at the warehouse level in the steel market. Demand, especially from the smaller manufacturers, is showing definite signs of slackening.

Most distributors, however, are entertaining more business than they can satisfy promptly. Their stocks are badly depleted and unbalanced, and substantial improvement in this respect over coming months is not in sight, especially in such short-supply products as plates, sheets, strip, bars and structurals.

Yet, though current demand outstrips distributors' supplies by a wide margin, a change in sentiment is developing in this market with many sellers anticipating a slackening in demand volume.

Spot check by STEEL'S district editors reveals sentiment throughout the country, while mixed, is less bullish. At some points business appears as robust as ever, but at others pressure is easing. Consumers are more price conscious. Some "fringe" warehouse interests are running for cover as buyers refuse to pay exorbitant premiums. Jobbers are scanning consumers' credit ratings more carefully and are cultivating the "good" accounts aggressively. Everywhere, a tightening up is underway in anticipation of a more highly competitive market.

STEEL'S district editors report:

NEW YORK—Jobber business was off in January, partly due to seasonal factors but chiefly because of the lack of steel to fill orders. Some distributors' floors are bare of sheets and plates with incoming shipments as light as at any time since the war. New inquiry is somewhat lighter.

BUFFALO—Mixed tendencies are noted here. Overall jobber business remains at high level. Withdrawal of some mills from this area is cause for criticism as the warehouses find it impossible to make new supply connections. In general, warehouse stocks are low.

CLEVELAND — Some smaller warehouses note a slackening in demand from the small manufacturing industries. One warehouse says its volume is off 20 per cent from mid-November. Customers' credit ratings are being scanned more carefully.

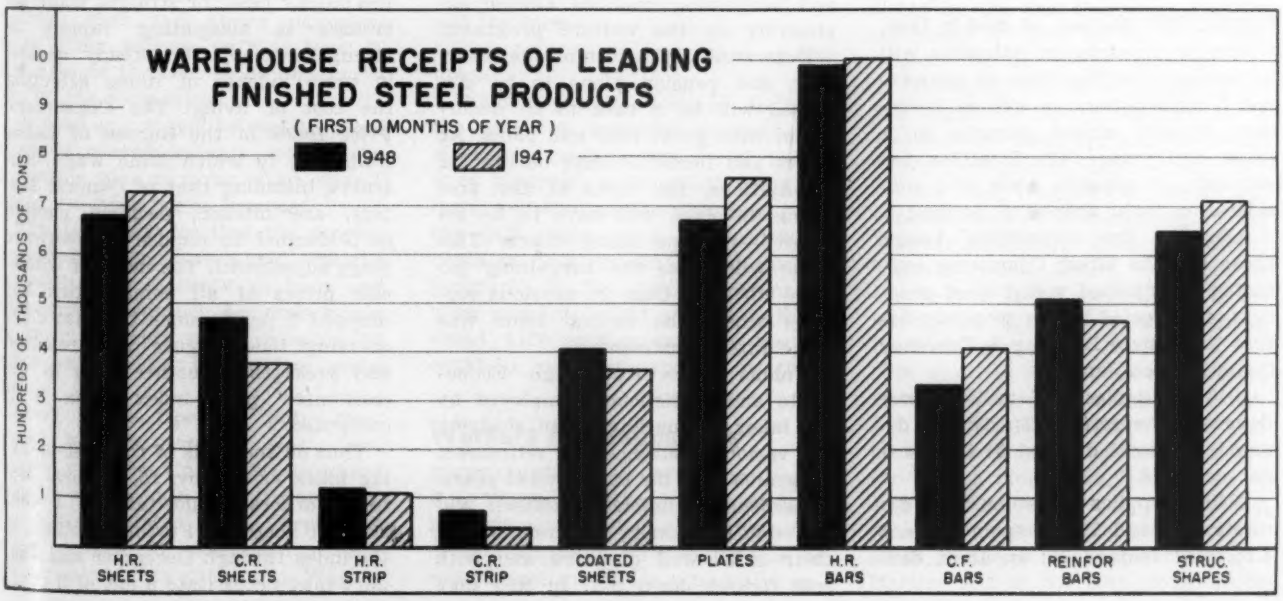
PITTSBURGH — Some easing in pressure for prompt deliveries is reported by smaller warehouses. Larger interests say demand and supply are in closer balance but they are unable to cope with all the business coming to them. Metalworking operations continue at high levels but purchasing agents are not accepting all the tonnage offered them.

CINCINNATI — Warehouse business here is off from last quarter levels. Both large and small interests have experienced a decline in inquiries. Small fabricators' needs are definitely lighter. Severe pinch exists in warehouse stocks of sheets, plates and structurals. Most other items are in easier supply than for some time.

BIRMINGHAM — Orders from the smaller shops have slackened, but local jobbers continue to do a large volume of business. Adverse weather conditions, to some extent, have curbed some buying.

DETROIT—No slackening in warehouse shipments is noted but new demand is tapering, though it is still far in excess of distributors' ability to satisfy. Slower output at stove and appliance plants has cut demand on the warehouses but this slack has been taken up by other users. Buyers appear more price conscious.

CHICAGO—While buyers are less frantic for steel, local warehouses continue to move carbon flat-rolled products as quickly as received. Buying resistance, however, is developing, and currently is noticeable in secondary products, particularly heavy gage sheets and some specialties. Needs of small stampers and fabricators, and tool and die shops have dimin-



ished. Household appliance manufacturers also are ordering conservatively.

DALLAS — Warehouses supplying large fabricators report no letup in demand, except for seasonal spottiness. One jobber here, serving large and small buyers, reports a slowing down in demand from both classes of customers, but expects a pickup in early spring.

SAN FRANCISCO — Buyers are more cautious in placing orders for future delivery and are less demanding for immediate needs. Definite decline in business from small fabricators is under way. Overall jobber business continues satisfactory, with stocks low.

Allocations Extension Asked

CONGRESS was asked by Commerce Secretary Sawyer last week to extend immediately the voluntary allocations program enacted by the 80th Congress.

Appearing before the Senate Banking Committee, he said that voluntary allocations authority, due to expire Feb. 28, should be extended on an interim basis through Sept. 30. Meanwhile, an overall approach to the economic stabilization problem will be developed and this will include provisions for a still longer extension of voluntary agreements.

Administering 14 Programs — At present the Office of Industry Cooperation is administering 14 voluntary plans. These have been extended beyond the expiration date of the allocations authority by the steel companies participating in the program. In addition, two other programs should be in operation soon.

Predicts 1949 Steel Shortage

EXPECTED shortage of steel in 1949, Commerce Department estimates, will be around 7 million tons of ingots—not 5 million tons or less as Secretary Sawyer stated recently in a press conference. The 5 million ton estimate, it appears, took into consideration only domestic demand.

Allowing for conversion losses, these are the latest Commerce estimates for finished rolled steel products, as revealed by the secretary before the Senate Banking & Currency Committee on Jan. 25:

1948: Supplies 65.7 million tons; domestic demand 70.2; export demand 4.2; total demand 74.4; apparent deficit 8.7.

1949: Supplies 68 million tons; domestic demand 70.8; export demand 4.2; total demand 75; apparent deficit 7.

Discussing new labor-management relations legislation to be presented in the 81st Congress are, left to right, seated: Clark Clifford, counsel to President Truman; Sen. Elbert D. Thomas, chairman of the Senate Labor Committee; Maurice Tobin, secretary of Labor; Cyrus Ching, conciliation director. Standing: Paul Herzog, National Labor Relations Board chairman, and Abe Murdock, NLRB member. NEA photo

Bargaining Becomes Complicated

Figuring costs of social insurance and pension plan demands to be headache for company negotiators. Unions to have advantage of experience and research

COLLECTIVE bargaining on 1949 labor contracts will be considerably more complicated than the negotiations of former years. This year the unions are shifting emphasis from straight wage increase demands to social insurance and pension programs. Possibly when the time arrives for settling the big, pattern-establishing contracts, the straight wage demands will have been washed out entirely and bargaining may be almost exclusively on the welfare programs.

Determining the cost of the insurance and pension plans to be discussed will be a task to be undertaken with great care and pains. As offers and demands shift during the negotiations, the costs of the programs involved will have to be refigured—perhaps many times. This alone will make the bargaining job more difficult than in previous sessions where the central issue was wage rate adjustments.

Unions Have Advantage—Economists and statisticians employed by the labor unions have been studying the various insurance and retirement programs over the past several years. Consequently, union spokesmen will arrive at bargaining conferences with their cases well prepared and with cost figures down pat. In this they may enjoy a considerable advantage over industrial negotiators, especially those representing the smaller and moderate-size companies. The larger metalworking companies have been making extensive studies of the costs of such welfare programs for their companies. Smaller companies often lack the facilities to undertake such studies on a comprehensive scale.

Price Indexes Falling—Belief that the unions' case for straight wage increases is dissipating rapidly is strengthened by the steady decline in price indexes of items affecting the cost of living. The Consumers' Price Index of the Bureau of Labor Statistics, to which some wage contracts, including that of General Motors, are hitched, declined enough in November to require a downward wage adjustment. The index of wholesale prices of all commodities has dropped 5 points since the last cost-of-living index figure was released and presages a further drop in the consumers' price index when it is computed.

Thus on the basis of the cost-of-living index as of Nov. 15, General Motors workers would take a 1 cent an hour decrease. Further declines in the index through December and January may necessitate a cut of 3 cents

at the next quarterly adjustment Mar. 1. This would wipe out the 3-cent increase which GM workers won Sept. 1. Should the downward trend in prices continue until June, as many believe it will, further cuts would be required, possibly offsetting the 3-cent annual "improvement factor" due May 31, at the end of the first year of the contract. Conceivably, GM workers, after June 1, will be receiving a lower wage than in June, 1948.

This obviously would weaken the demands of other workers for a straight wage increase.

Ford First Big Test—First negotiations of wage and social security demands in a top level company will be between the United Automobile Workers and Ford Motor Co., probably around May 15, or 60 days before the company's present union contract is scheduled to expire.

A complete new contract is to be written in this case and its provisions may influence the bargaining of other metalworking companies.

The head of the Ford local has proposed an industry-wide conference to develop a uniform pension plan to apply to all companies, large and small, in the automotive and parts industries, covering an estimated 1 million employees. Such an arrangement would prevent loss of pension rights to workers changing employers within the industry and would give coverage to union members in shops employing too few to make pensions practical. The scheme resembles that of the United Mine Workers in some respects. It is expected to meet stiff opposition in the automotive industry which traditionally has been against industry-wide bargaining.

Ask $100 Pensions—The UAW has stated that it will seek pension plans to provide all workers with $100 per month, over and above payments from other sources, with at least 70 per cent of the cost to be underwritten by the companies.

A year ago, it will be recalled Ford workers overwhelmingly voted down a pension plan in favor of an extra 7 cents an hour wage increase.

The UAW figures that the pension program it advocates would cost the industry 8 or 9 cents an hour and that social insurance demands would be 5 or 6 cents more, possibly 15 cents an hour for the welfare package.

Steel Pacts Open in July—Contracts between the big steel companies and the United Steelworkers may be reopened in July. Technically, the United States Steel Corp. contracts provide for discussion of only two subjects this year: (1) Wages; and (2) social insurance.

The contract makes no provision for bargaining on pensions this year. However, the union has readied a pension plan calling for retirement benefits of $150 a month and estimated to cost 13.5 cents an hour per employee. The steelworkers will make strong efforts to bring this into the bargaining discussions and may be allowed to do so.

Insurance Plans Vary—The United Steelworkers has several social insurance programs, varying in cost from slightly more than 5 to about 10 cents an hour per employee. These are to be used as the basis for negotiating with the various sizes and types of steel and metalworking companies with which it has contracts.

The program presented last year to U. S. Steel and several other large producers was estimated to cost 11.14 cents gross or 9.65 cents net per hour per employee. The program calls for:

1. Life insurance amounting to 18 months' pay for active employees.
2. A paid-up policy of $1500 for employees retired for age or disability.
3. Cash benefits of $35 a week for nonoccupational sickness and accidents.
4. Hospitalization benefits of $8 per day, plus $80 for services and extras during each confinement, but not for more than 70 days.
5. Reimbursement of surgical fees on a standard $225 scale.

Hospital and surgical benefits would extend to workers' dependents.

Counter Proposal—U. S. Steel countered with a social insurance program covering about the same ground, but with slightly lower benefits. The corporation proposed that the cost of the program, estimated at 5 cents an hour per employee, be shared equally by the company and the workers.

This plan was not accepted by the union.

When negotiations reopen in July, the union is expected to ask consideration of both the social insurance program, costing 9.65 cents an hour, and the pension program, costing 13.5 cents, or a total of 23.15 cents an hour per employee. Such a program, in the unlikely event it were granted, would cost U. S. Steel about $120 million annually, nearly equal to total net earnings in 1948.

Workers Aid Refinancing

EMPLOYEES of the Waltham Watch Co., Waltham, Mass., have pledged $318,500 toward the equity financing of the company, now in process of reorganization. Under a tentative reorganization plan outlined by the Reconstruction Finance Corp., the RFC would lend $5 million to the company, $1 million would be raised by bank loans and $3 million in equity financing would come from workers and citizens of the community.

Workers' subscriptions were offered at a meeting of the American Watch Workers Union-independent, at which 820 of the 2300 employees pledged themselves to aid in the refinancing plan. The union expects its members to subscribe for at least $1 million of a new stock issue.

Walter Conerazzo, union president, told workers and other citizens of the community that they as representatives of the middle class must now supply the risk capital for private enterprise. Raising of the American standard of living to its present levels, he said, has almost wiped out the wealthy class that formerly supplied the risk capital.

Also under way by the union is a campaign to reduce imports of Swiss watches.

Offer Annual Wage Bill

GUARANTEED wage plans are going to be used much more widely in industry if a bill introduced by Senators Henry Cabot Lodge Jr. (Rep., Mass.) and Brien McMahon (Dem., Conn.) is approved by Congress. Numbered S. 546, it would amend the Walsh-Healey Act to provide that any manufacturer receiving a government contract in any amount exceeding $10,000 would have to stipulate that his employees will be paid on an annual basis.

Moderate Labor Law Likely

WHILE the Taft-Hartley label will be removed from whatever labor-management relations legislation is enacted by the 81st Congress, don't be surprised if some of the T-H provisions bob up in the new law.

The legislators are not going all out for organized labor's demand for a two-package labor law action—repeal of the Taft-Hartley and re-enactment of the old Wagner Act now and consideration of amendments to the Wagner Act later. Even Sen. Elbert Thomas (Dem., Utah), chairman of the Senate Labor Committee, is insisting on adequate deliberation in the framing of a new law.

In addition, Republican and conservative Democratic leaders are working for inclusion of many of the T-H provisions in the new law, and are conceded a more than fair chance of success. Remember that a majority of both houses of the present Congress went on record for the Taft-Hartley Act in the 80th Congress.

Pricing Bill Progresses

Johnson bill allowing freight absorption seen favorably reported by Senate committee

THAT S. 236, a bill introduced by Sen. Edwin C. Johnson (Dem., Colo.) to clarify existing uncertainty as to the legal status of delivered prices, will be favorably reported by the Senate Committee on Interstate & Foreign Commerce appeared virtually assured last week.

In preparing to wind up its studies, the subcommittee last week held brief hearings at which several Federal Trade Commission members and staff spokesmen, and a number of other government brass hats appeared. Among these, Secretary of Commerce Charles Sawyer declared that "obviously some clarification is desirable."

Up To Business—"Under American concepts of free enterprise, the decision as to what form of pricing practice to follow, subject to restrictions with respect to conspiracy, coercion, discrimination and other unfair practices, should be left to the judgment of individual business enterprises made in the light of market conditions," the secretary of commerce pointed out.

Commissioner Ewin L. Davis, who had not appeared previously before the subcommittee for a thorough exposition of his views, supported the commission's attitude that no clarifying legislation is necessary. The commission, he said, never questioned freight absorption where there was no law violation. It was his position, he said, that "a seller may absorb freight, or absorb part of his manufacturing costs in order, in good faith, to meet an equally low price of a competitor."

Senator Johnson proposes that sections 5 (a) and (b) of the Federal Trade Commission Act and sections 2 (a) and (b) of the Clayton Act be amended. Present provisions of the laws would be continued, but additions are suggested that would permit basing point and similar pricing practices when such are engaged in without collusion or conspiracy.

Ask FTC Outline Steel Case

RESPONDENTS' attorneys in the steel pricing case before the Federal Trade Commission have gone over the head of Trial Examiner Frank Hier by appealing to the commission for a ruling to force FTC Trial Attorney Lynn Paulson to give them a definite outline of his case against the American Iron & Steel Institute and the steel companies named in the FTC complaint.

Examiner Hier has refused to make such a ruling. If the commission upholds Hier, respondents' attorneys are expected to move for dismissal of the case. Indications, therefore, are that the deadline for respondents' motions to limit the evidence may be postponed beyond the Jan. 31 date set some time ago.

FTC's Discounts Move Discounted

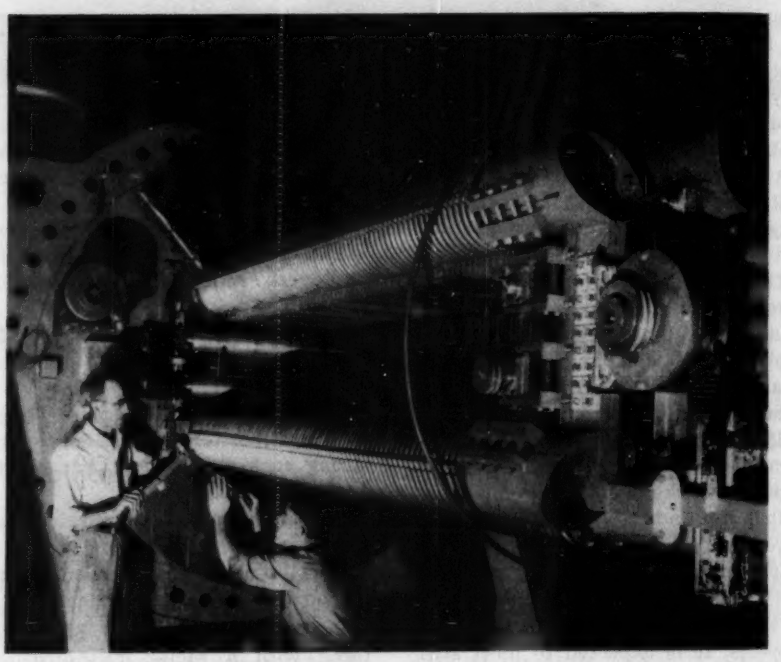
STEEL and metalworking executives are not too concerned over the Federal Trade Commission's move to regulate quantity discounts held to be discriminatory or monopolistic.

Steel men doubt that the industry's quantity extra system will come under attack. The apparent purpose of the FTC action with respect to discounts is to prevent a very few customers from obtaining an undue competitive advantage by virtue of buying in larger quantities than the vast majority of customers can afford to do. While the quantity extra system gives a lower (base) price to volume buyers, the number of steel users who can take advantage of this price is so great that discrimination or promotion of monopoly can hardly be considered to be involved. Both mills and warehouses have set their base quantities low enough so that the majority of their customers can enjoy the lower price.

Quantity extras are established on a basis of added cost to the mill or other seller in handling and processing the smaller order. Metalworking executives do not believe this type of practice will come under FTC attack.

Some metal consuming companies may be affected by the FTC-imposed discount limits. The extent of this cannot yet be determined.

One device now used, which circumvents the quantity discount arrangement, may be more widely employed should the FTC bear down on discount regulation. This is the practice of ordering to specification, with price being determined on a cost-plus basis in which the actual quantity ordered plays an important part. To some extent, this practice is now employed by the large mail order houses and other big buyers of finished goods and components and parts.



ELECTROSTATIC ACCELERATOR: Shown in General Electric Co.'s laboratories, this machine under construction for the Brookhaven National Laboratory at Upton, Long Island, carries electrostatic charges from one end of the machine to an aluminum sphere at the other end by two moving belts. Not yet installed, these belts will travel between the two long tubes shown in the foreground. The voltage on the sphere will serve to accelerate a steady stream of protons through the accelerator tube to a target, where the reaction is studied

Record Steel Expansion in 1948

IRON and steel industry spent a record $583 million during 1948 to ex-

pand and improve production facilities, according to the American Iron & Steel Institute. More will be spent this year, expenditures of $627 million being projected. Total outlay of more than $2 billion will have been made by the end of this year for postwar expansion and improvement.

At that time it is expected annual steelmaking capacity will be at a record high level exceeding 98,300,000 tons. An additional 500,000 tons will be added in 1950.

Capacity Increased—The huge total outlay last year enabled producers to increase combined steelmaking capacity by more than 1,887,000 tons. In addition the companies increased blast furnace and coke oven capacities, and other raw material departments, and added to processing and finishing facilities.

This year's plans for a record outlay of $627 million will increase steel capacity by about 2,200,000 tons, and will provide necessary finishing facilities.

The amount spent last year, when 1,887,000 tons of capacity was added, was more than four times greater than ten years earlier when about 1,600,000 tons was added to raw steel capacity with the companies' expenditures totaling only $140 million.

Pig Iron Output Increases

PRODUCTION of pig iron and ferroalloys in blast furnaces increased about 2-1/2 per cent to 60,848,840 tons in 1948 fom 59,314,348 tons in 1947, according to the American Iron & Steel Institute.

This represented the third largest total in the industry's history, having been exceeded only in 1943 and 1944. Blast furnaces were operated at 90.2 per cent of capacity last year, compared with 90.3 per cent in 1947.

Production of pig iron alone came to 60,135,941 tons in 1948 compared with 58,507,169 tons in 1947. December production of pig iron amounted to 5,525,282 tons compared with 5,329,980 tons in November and 5,097,872 tons in December, 1947.

Ferro Output Up — Ferromanganese and spiegeleisen output totaled 712,899 tons in 1948 against 702,561 tons in 1947 with December production in the respective years amounting to 69,766 tons and 79,265 tons.

Of total pig iron production in 1948, the Pittsburgh-Youngstown district accounted for 23,634,734 tons; Chicago, 12,579,049 tons; eastern, 11,628,560 tons; Cleveland-Detroit, 6,076,147 tons; southern, 4,667,144 tons; and western, 2,263,206 tons.

Total production of steel ingots last year, amounting to 88,533,729 tons, included 8,472,781 tons of alloy steel against 7,345,527 tons in 1947, and 11,254,227 tons of hot-topped carbon ingots against 11,352,415 tons in 1947.

Distribution of total ingot production by districts in 1948 was as follows: Pittsburgh-Youngstown, 35,524,711 tons; Chicago, 19,252,549 tons; eastern, 17,249,374 tons; Cleveland-Detroit, 7,505,915 tons; western, 4,693,503 tons; and southern, 4,307,677 tons.

Industrial Furnace Backlog Off

MEMBERS of the Industrial Furnace Manufacturers Association, meeting in Cleveland last week, expected that business for the first two quarters of 1949 will hold at about the levels of 1948.

Beyond July 1, prospects are more uncertain as order backlogs are down about 30 per cent, inquiries are fewer and new orders currently are off somewhat. Prices show a leveling tendency but no furnace builder so far has reduced prices.

In case of a national emergency the industrial furnace industry is in position to turn out twice as many furnaces as during the last war. Lee Wilson, chairman, Lee Wilson Engineering Co. Inc., Cleveland, discussing mobilization plans, said mostly standard furnaces would be required with some of special type. The situation will be reviewed every six months for possible revisions in the pool order program.

At the association's banquet, awards for prize-winning articles on furnace practice were presented to Floyd J. Kamin, Kamin Die Casting & Mfg. Co., Chicago; Thomas A. Frischman, chief metallurgist, Axle Division, Eaton Mfg. Co., Cleveland; and I. Stanley Wishoski, editor, *Industrial Heating*, Pittsburgh. J. H. Redhead, president, Lake City Malleable Co., Cleveland, was banquet speaker.

Moreell Urges Tax Reform

CHANGE in federal tax law to allow companies to write off the cost of new equipment more rapidly has been proposed by Admiral Ben Moreell, president of Jones & Laughlin Steel Corp., Pittsburgh.

He suggested "that companies be permitted to write off up to one-half of equipment costs within one to five years as they choose and that they be allowed to deduct this amortization from taxable income."

Admiral Moreell said "there should be a limit on the amortization deducted in any one year. I propose it to be set at one-half the taxable income for that year before the amortization is deducted." The present tax law, he added, gives no relief for the doubled cost of new plant and equipment.

The government would not lose money in the long run under the proposed tax change, Admiral Moreell said, because reductions during the amortization period would amount to no more than a deferment of payment. Uncle Sam might even gain because the nation's industry would be able to produce more and thus be able to pay more taxes.

PIG IRON AND FERROALLOY PRODUCTION FOR DECEMBER AND 1948 YEAR

Blast Furnace Capacity and Production—Net Tons — DECEMBER - 1948

	Number of companies	Annual blast furnace capacity	Production: Pig Iron — Current month	Pig Iron — Year to date	Ferro Manganese and Spiegel — Current Month	Ferro Manganese and Spiegel — Year to date	Total — Current month	Total — Year to date	Percent of capacity — Current month	Percent of capacity — Year to date
DISTRIBUTION BY DISTRICTS:										
Eastern	11	13,093,560	1,064,433	11,269,401	34,568	359,159	1,099,001	11,628,560	99.3	88.8
Pittsburgh-Youngstown	17	25,588,120	2,074,280	23,388,146	28,105	246,588	2,102,385	23,634,734	97.2	92.4
Cleveland-Detroit	6	6,495,000	559,246	6,076,147	-	-	559,246	6,076,147	101.8	93.6
Chicago	7	14,700,290	1,179,431	12,568,859	-	10,190	1,179,431	12,579,049	94.9	85.6
Southern	8	4,949,660	430,934	4,570,182	7,093	96,962	438,027	4,667,144	104.7	94.3
Western	3	2,612,300	216,958	2,263,206	-	-	216,958	2,263,206	98.2	86.6
TOTAL	35	67,438,930	5,525,282	60,135,941	69,766	712,899	5,595,048	60,848,840	98.1	90.2

Machine Tool Sales Rise

January business holds up fairly well following upswing in last two months of 1948

SALES to aircraft builders and the placing of some orders under the Marshall Plan are helping to maintain January machine tool business at a fairly brisk pace. In addition, although builders are still competing with war surplus equipment, improvement in the efficiency of the latest models plus the desire of many manufacturers to cut production costs are said to be having some beneficial effect on sales of new machine tools.

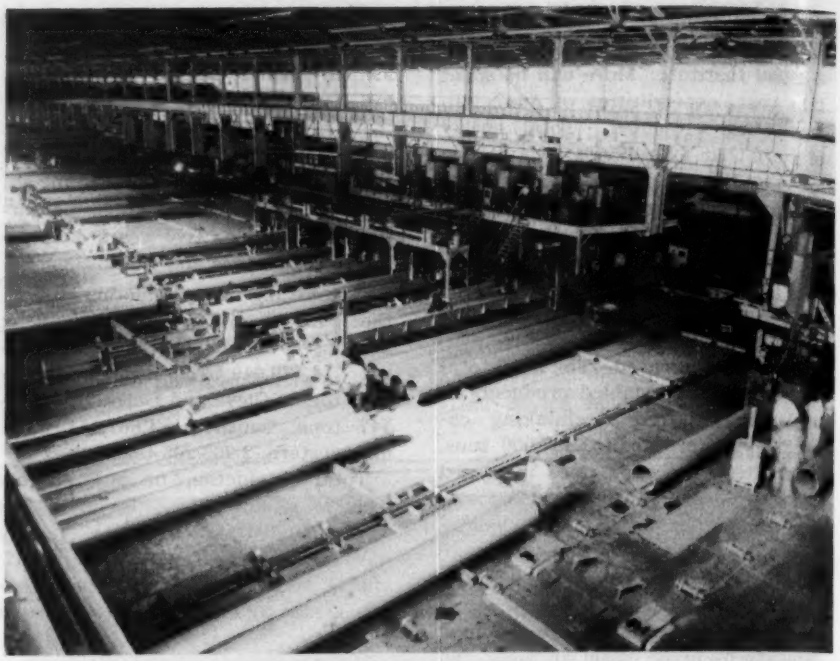
This improvement was demonstrated in the December index of the National Machine Tool Builders' Association, Cleveland, issued last week. The index of new orders rose to 76.7 from 72.2 in November. Although part of this advance may have been due to the usual yearend cleanup orders, the decline in new orders has been checked following a dip to the year's low in October. December shipments climbed sharply to an index figure of 96.9 from 76.2 in November, causing the ratio of unfilled orders to drop to 3.2-1, lowest since the war's end. The index of foreign orders, which is included in total new orders, declined slightly in December to 16.2 from 18.1 in the preceding month but it was still at the second highest point for the year.

Both new orders and shipments indexes are based on average annual shipments for the years 1945-46-47 being equal to 100. Average annual shipments for the base period amounted to $334 million.

Auto Tooling Slow—Reports from Detroit indicate that there is little activity in new machine tool sales to automobile builders. The $400 million retooling program in the industry is just about completed and demands for new machine tools by the automobile builders are expected to lag until another round of new models is being planned.

In Cleveland negotiations have been resumed by Warner & Swasey Co. and the striking District 54, International Association of Machinists. The plant has been idle since Dec. 27 when the strike involving 1,800 employees began.

Tool and die shops report that currently business is in the doldrums but are hopeful that tooling up for the aircraft building program and model changes made necessary by a more competitive market in a variety of metalworking industries will increase their activity.



Capacity operations have been reached on 24-inch high-pressure pipe at this new mill at Gadsden, Ala., and production of 30-inch pipe soon will be started. Output in 1949 is estimated at 850 miles of large-diameter material. That's why . . .

Republic's New Pipe Mill Helps Ease Gas Shortage

PRODUCTION of 30-inch high-pressure fusion-welded steel pipe will be started within the next few months at the new Gadsden, Ala., mill of Republic Steel Corp. Mill now is operating at capacity making 24-inch pipe for gas lines.

First shipments from the new mill were made last July. During the intervening 6½ months production "bugs" have been ironed out, work crews trained, and production raised to more than the original capacity estimates.

During 1949, Republic expects to produce more than 800 miles of pipe. During the last half of 1948, production of 24-inch pipe amounted to 250 miles, or almost 50,000 tons.

Improves Gas Supply — Production of the mill to date has been shipped to four customers, all suppliers of natural gas. One line already has been completed with the mill's product and has resulted in a considerable improvement in the supply of natural gas to the Birmingham area.

The gas industry has been so completely sold on the desirability of large-diameter electric-welded pipe that the Gadsden mill is booked for the next four years and Republic anticipates a satisfactory market for its product for many years to come.

Integrated with Steel Plant—The Gadsden pipe mill is well integrated with Republic's steel plant there. The pipe mill buildings adjoin and connect with the 112-inch plate mill upon which the skelp for the pipe is rolled. This mill is supplied with slabs from the adjoining steel furnaces and blooming mill where eight open hearths with an annual capacity of nearly 650,000 net tons are in operation. Backing up the open hearths are two blast furnaces, one of which is operated on a long-term lease from the government for whom the stack was built by Republic during the war.

Manganese Supply Threat Seen

PRECARIOUS supply position of manganese ore is expected to come in for major attention at hearings by the Senate Committee on Interior & Insular Affairs to consider proposals to set up a national policy for development, utilization and conservation of mineral resources. The hearings start Jan. 31 with Interior Secretary Krug the first witness.

The nation's position with respect to manganese supply is said to be particularly critical in view of the report Russia is not renewing contracts to ship manganese here. Russia, it is said, seeks certain machinery and equipment for her manganese ore. Latest data show 47 per cent of the nation's manganese supply comes from Russia.

Sees No Letup in Orders

U. S. Steel chairman optimistic. Reports corporation percentage return on sales off in 1948

HEAVY DEMAND which brought about new alltime steel production records by U. S. Steel Corp. in 1948 will continue for some months to come, Irving S. Olds, chairman of the corporation, believes.

Analyzing last year's production and financial performance and studying the outlook for 1949, Mr. Olds, at a press conference following the corporation's quarterly directors' meeting in New York last week, said the corporation has received only a few scattered cancellations of orders, and they have been of relatively minor importance.

Record Shipments—Steel products shipments of the corporation's subsidiaries in the fourth quarter of 1948 totaled 5,467,696 net tons, a new record for any fourth quarter in U. S. Steel's history. Shipments for the year 1948 aggregated 20,597,570 net tons, a new peacetime record. Total shipments in 1947 were 20,241,706 net tons. Production of steel ingots and castings during the fourth quarter of 1948 averaged 99.4 per cent of rated capacity, and for the entire year, 93.8 per cent.

Net income for the fourth quarter was $41,510,274, a 5.7 per cent return on sales. Third quarter net income was $34,599,132, a 5.6 per cent return on sales. Net income for the year 1948 was $129,552,424, a return of 5.2 per cent on sales, compared with $127,098,148 and 6.0 per cent in 1947.

Propose Stock Split—Action at the directors' meeting last week included decision to ask the corporation's stockholders at their annual meeting May 2 to authorize a 3-for-1 common stock split that would increase the 8,703,252 outstanding common shares without par value to 26,109,756 common shares without par value.

Inland Steel Co.

INLAND STEEL Co., Chicago, had a net income of $38,606,899 in 1948. In 1947 net income was $29,888,558. Sales in 1948 were $394,712,845, compared with $316,338,565 in 1947.

Jones & Laughlin Steel Corp.

INCREASED dollar volume of sales produced rises in net income figures of Jones & Laughlin Steel Corp., Pittsburgh.

Fourth quarter net income was $10,973,134, compared with $8,757,416 in the third quarter of 1948 and $5,700,853 in the fourth quarter of 1947. Net income for the year 1948 was $31,222,451, compared with $19,225,184 in 1947.

Armco Steel Corp.

PRELIMINARY figures indicate Armco Steel Corp., Middletown, O., had a net income of $32 million in 1948. Net income in 1947 was $25,002,211.

Colorado Fuel & Iron Corp.

NET EARNINGS of Colorado Fuel & Iron Corp., Denver, rose to $3,270,597 in the fourth quarter of 1948, compared with $1,740,110 in the corresponding period of 1947. The company, whose fiscal year ends June 30, reported a net income of $5,696,257 in the last half of 1948, compared with $3,138,014 in the like period of 1947.

Carpenter Steel Co.

CARPENTER Steel Co., Reading, Pa., reported its net income in the fourth quarter of 1948 was $656,616, compared with $341,789 in the corresponding period of 1947 and $522,508 in the third quarter of 1948. The company's fiscal year ends June 30.

Keystone Steel & Wire Corp.

SALES and net income of Keystone Steel & Wire Co., Peoria, Ill., during the fourth quarter of 1948 reflected shutdown then of a rod mill for improvements and expansion. Sales totaled $8,425,591 and net earnings were $922,350. During the fourth quarter of 1947 net earnings were $1,110,058.

Rod mill production is increasing steadily and expansion of more than 20 per cent in its capacity is expected to increase the company's finished wire production and reduce operating costs.

Wheeling Steel Corp.

WHEELING Steel Corp., Wheeling, W. Va., set new records for dollar volume of sales and net earnings in 1948.

Net earnings were $15,050,045, compared with $12,445,161 in 1947. The 1948 net earnings represented a return of 9.7 per cent on $155 million of sales, and about 9.8 per cent on the company's capital investment.

Lukens Steel Co.

NET INCOME of Lukens Steel Co., Coatesville, Pa., was $2,411,604, or 3.9 per cent of sales, during the 52 weeks ended Oct. 30, 1948. During a 56-week period ended Nov. 1, 1947, the company's net income was $2,835,702, or 5.3 per cent of sales. In 1947 the accounting period was 56 weeks because of consolidation of company subsidiaries into divisions of the company.

Alan Wood Steel Co.

ALAN WOOD Steel Co., Conshohocken, Pa., reports a net income of $4,100,000 in 1948, compared with $1,955,446 in 1947. Net sales in 1948 were $47,625,000, a 32 per cent increase over the $36,080,000 in 1947.

Bethlehem Steel Corp.

BETHLEHEM Steel Corp. reports net income of $90,347,560 for 1948, compared with $51,088,375 in 1947. Earnings for the fourth quarter, 1948, amounted to $37,163,702, compared with $12,377,647 in the December quarter of 1947, and $22,584,752 in the September quarter of 1948.

Stockpiling Gains Speed

Program reaches 39 per cent of of present goal. All of fiscal year's appropriations obligated

NATIONAL stockpile of strategic metals and minerals now on hand, contracted for, and earmarked for subsequent purchase now totals $1,446,000,000, or 39 per cent of the present goal, according to Donald F. Carpenter, chairman, Munitions Board, National Military Establishment. At existing prices, the stockpile will have a total estimated value of $3,693,000,000 when the ultimate purchase program is completed.

Sufficient quantities of materials to meet 1949 fiscal year stockpiling goals for one-half of the 68 items on the critical list have been contracted for, or promised by producers. Progress on the remaining half ranges from 50 to 99 per cent for 14 items, and from 8 to 48 per cent for the remainder.

Earmarked—The full $525 million in appropriations and contractual authority of stockpiling purchases for this fiscal year already has been obligated or earmarked.

Stockpiling has been stepped up by making purchases even where they would conflict with civilian demands. However, attention is being given to the use of substitute materials where possible and the military services are keeping their stockpiling needs to the minimum necessary for national security.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor, STEEL*

Determined group in Washington working to put government in steel industry through loans or investments. Interdepartmental committee studying capacity and needs

A SMALL but determined minority in Washington can do wonders in working its will with the government. A good illustration is the move to siphon taxpayers' money into steelworks construction—by way of loans, or investments, or both.

Active proponents of the idea are Sen. James E. Murray (Dem., Mont.), Sen. Joseph C. O'Mahoney (Dem., Wyo.), Rep. Wright Patman (Dem., Tex.), C. Girard Davidson, assistant secretary of Interior, Leon H. Keyserling, President's Council of Economic Advisers, Dr. Louis H. Bean, Department of Agriculture economist, and the officers of the CIO and several of its unions, notably the United Steelworkers and the United Automobile Workers. There are some few others, but the foregoing are the bellwethers of the move.

The great majority of people in government—and this includes administration agencies and Congress—are fundamentally opposed to anything that would weaken the private enterprise system in the United States. But this must not be taken to mean that they are opposed to the idea of getting the government behind steelworks expansion. President Truman is a warm advocate of the private enterprise system. And yet Mr. Truman saw nothing contradictory in including in his State of the Union message the proposal that study be given the proposal to get the government into the steel business.

Steel Is First—In any event, work actively is going forward on this study. Looking into the whole matter is an interdepartmental committee headed up by the Department of Commerce. The first material tackled is steel. Roughly, it is a matter of determining how present steel capacity, with due consideration for the expansion program now under way, stacks up in the light of anticipated needs—say, the needs over the remainder of this year, and the needs five years from now, in 1954.

After this steel report goes to the White House and to Congress—around Apr. 15 there will be administration study with reference to the financial problems, namely, whether private industry can be expected to expand as indicated by the demand expectation, what inducements must be offered to private industry to get it to undertake the indicated expansion, the terms under which government money should be made available for steelworks expansion, etc. It would be little short of miraculous if all that study could be completed and a law written in time for adoption at this session of Congress.

Texas Wants Plants—However, this outlook may be considerably shortened as a result of the application of the Lone Star Steel Co. for a government loan to finance construction of open-hearth furnaces and a pipe mill alongside its blast furnace at Lone Star, Tex. This application is backed up by the most effective influences imaginable — the Texas delegation in Congress and elsewhere in the government. Representative Patman, who is 100 per cent back of the project, told STEEL that there is no doubt about the need for more tubular goods in Texas. As a matter of fact, Mr. Patman said, northeastern Texas needs the output of six, not one, new steel plants. The expectation seems warranted that the Lone Star application is but the first of a number to be put in shortly to the government for loans to build steel plants, not only in Texas but in other western states.

Under existing law the Reconstruction Finance Corp. is fully clothed with authority to make loans on projects of this kind. There was some doubt among RFC directors as to how far they might go in insisting on using their own judgment in making such loans. But that was resolved when, under strong administration pressure, they approved substantial loans to a prefabricated housing manufacturer.

Antimonopoly Move?—It would be interesting to see what would happen should one of the existing big steel companies apply for a government loan to build a new steel plant. Every one of the supporters of the government steelworks proposal is an arch-antimonopolist, and a fundamental plank in their platform is that the government must do something about steel because "steel is a monopolistic industry." It will be recalled that President Truman attacked the steel industry during his campaign talks last year as monopolistic. Only last week Representative Patman made another speech accusing a steel company of acquiring a steel fabricator and putting it into competition with a former customer to which it no longer was shipping steel.

So Washington is asking questions such as this: Is it the real purpose of the government steel plant proposal to break down so-called monopoly in the steel industry? Common opinion is that such a move actually has been launched, and only time will reveal the full program and its effects.

Small Orders Costly

IT COSTS the government $12.85 to process an order for less than $10 worth of merchandise or service—and that is over and above the cost of the goods or service covered by the order. This is one of the findings of the Hoover Commission on the Reorganization of the Executive Branch of the Government. About 1,500,000 of these small orders are placed annually by the civilian branches and the cost of processing them comes to about $20 million. This total makes no allowance for the cost of processing small orders placed by the armed services; the Hoover commission did not get that far.

In a recent press conference, ex-President Hoover said that the recommendations of the commission will show how $3.25 billion of taxpayers' money now is wasted annually—waste that can be prevented by using efficient methods. Mr. Hoover, in commenting on the 16 or so reports which the commission will submit, thinks few people will read them—but this opinion is not shared by laymen who know something about the explosive potentials implied by some of the Hoover findings. Anyway, those desiring to read them will have the opportunity to do so. The Superintendent of Documents, Government Printing Office, Washington 25, D. C., is accepting blanket subscriptions, at $10, for a complete set of the printed reports. They are slated to be made available in February and March.

Teen-Agers Help Scrap Drive

TEEN-AGE boys and girls are responsible for a considerable measure of the success, to date, of the current drive for ferrous farm scrap, according to Secretary of Commerce Sawyer. He cites an instance in which

McKAY

STANDARD UPCOILERS

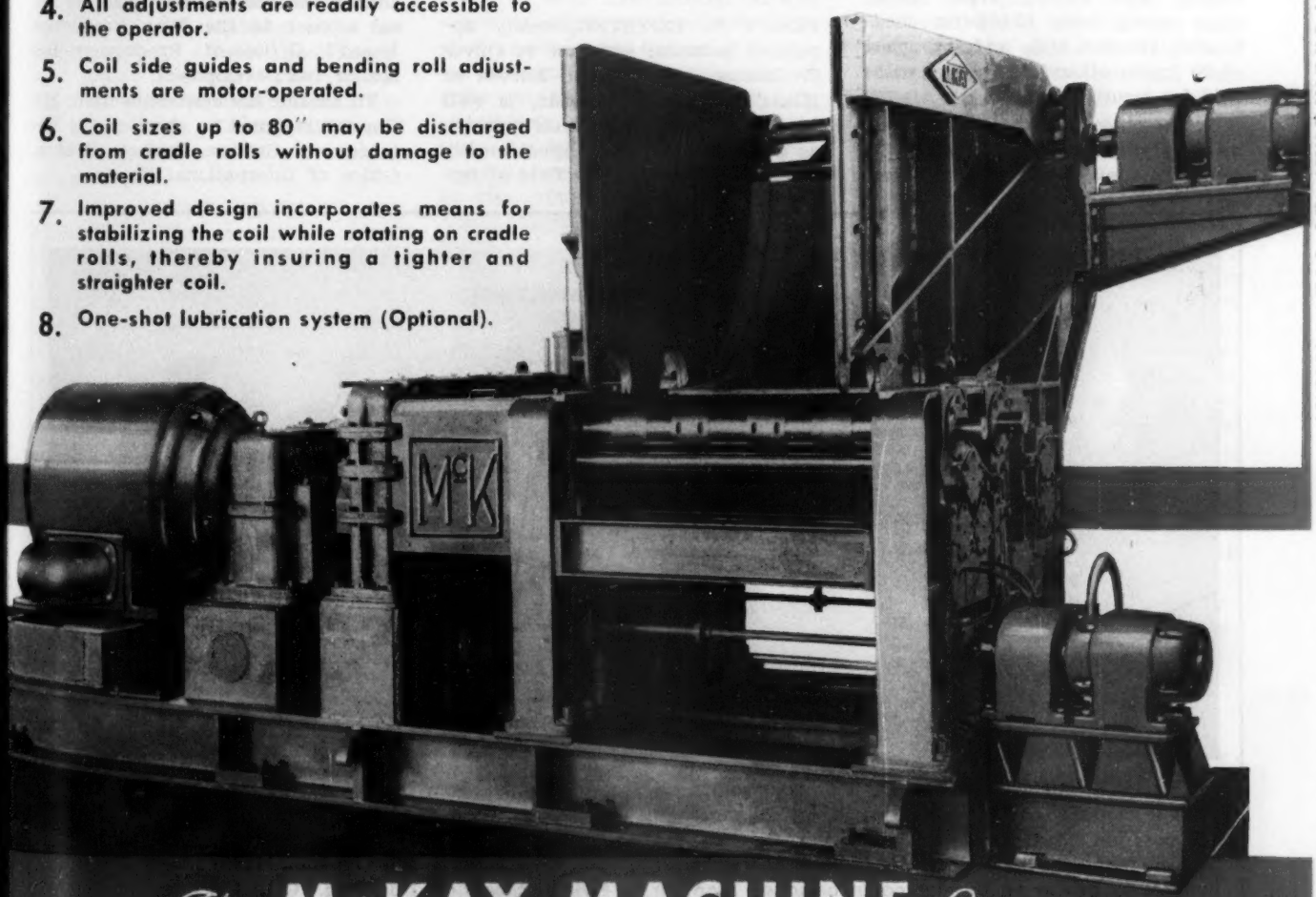
Improved features

1. Steel castings or welded steel construction throughout.
2. Roll drive and roll assemblies use anti-friction bearings.
3. All rolls with their assemblies are easily removed thru the outboard housing without further dismantling.
4. All adjustments are readily accessible to the operator.
5. Coil side guides and bending roll adjustments are motor-operated.
6. Coil sizes up to 80" may be discharged from cradle rolls without damage to the material.
7. Improved design incorporates means for stabilizing the coil while rotating on cradle rolls, thereby insuring a tighter and straighter coil.
8. One-shot lubrication system (Optional).

Designed and built with capacity to coil hot or cold strip in various thicknesses and in widths from 24" to 96".

Rugged construction for steel mill service insures continuous performance with minimum maintenance.

Compact design reduces floor space requirements.



The **McKAY MACHINE** *Company*

ENGINEERS AND MANUFACTURERS OF SHEET, TIN, AND STRIP MILL EQUIPMENT

YOUNGSTOWN, OHIO

ASSOCIATED COMPANY The WEAN ENGINEERING CO., Inc. • WARREN, OHIO

three 11-year old girls in the Cincinnati area turned in 857,000 pounds of farm scrap. He told of another in which four boys collected some 300 tons of farm scrap. Despite the soft price situation in the scrap market, said Mr. Sawyer, the drive will be continued energetically since the supply of scrap from a long-range point of view will continue to be a matter of concern.

Shipbuilding Program Studied

SLOW in getting organized, the House Merchant Marine & Fisheries Committee now is considering bills to extend authority of the Maritime Commission to operate vessels, and to compel 50 per cent American flag participation in moving ECA cargoes, but it shortly will consider the shipbuilding program recommended by the commission for fiscal 1950. The program calls for $85 million to subsidize construction of 17 merchant ships plus authority to grant additional subsidies for speed and other national defense features. Top priority would be given to two prototype vessels which would pave the way for replacement of the present Liberty and Victory ships. These ships would have 10,000-ton deadweight, 450-foot hulls and top speed of 20 knots; other features are withheld for security reasons.

Of the other 15 ships, to be owned and operated by private lines, 10 would be tankers and the other five cargo or combination vessels; all would have high speeds.

The committee again will consider last year's request by steamship owners for a flat 50 per cent subsidy to take care of extra costs of construction in United States yards as compared with European yards. Last year the commission authorized 45 per cent subsidy on two combination boats for American Export Lines and 44.5 per cent subsidy for three boats for the American President Lines. Now awaiting subsidy action are the superliner on which United States Lines opened bids in December and one to five tankers on which Standard Oil of New Jersey took bids in October.

Patent Rules Available

REVISED "Rules of Practice of the Patent Office," after a year's preparation, has been sent to the printer and copies will be available for distribution in a week. Patent attorneys, inventors and other interested parties can obtain free copies by writing the Patent Commissioner, Washington 25, D. C.

Royster to Bureau of Mines

PERCY H. ROYSTER, newly appointed technical assistant to Oliver C. Ralston, chief of the Bureau of Mines' Metallurgy Division, is well known to the iron and steel industry as a result of a career spent mostly in research work in the field of ferrous metallurgy. Among his developments is the process for pelletizing finely ground magnetic concentrates from taconite which now is in use at the demonstration plant at Aurora, Minn., which is producing 600 tons of concentrates daily from magnetic taconite. Other Royster processes developed include production of standard ferro-manganese from low-grade, high-phosphorus manganiferrous iron ores; production of commercial ferrochromium from low-grade chromite; production of 50 per cent ferro-silicon in the blast furnace instead of the usual electric furnace; conversion, by magnetic roasting, of hematite into magnetite to permit magnetic concentration; and others.

A graduate of the University of North Carolina and Harvard University, and of the Harvard University Graduate School, Mr. Royster has served in numerous connections, some with the government and others with private research and other organizations. He was with the Bureau of Mines at Pittsburgh and Minneapolis from 1916 to 1925; from 1938 to 1941 he was director of research in connection with a cooperative project sponsored by several independent steel companies. During the war he was head technical adviser to the War Production Board's Office of Production Research and Development.

To assume his new connection, Mr. Royster resigned as chief of the Requirements Section, Projects Branch, Office of International Trade.

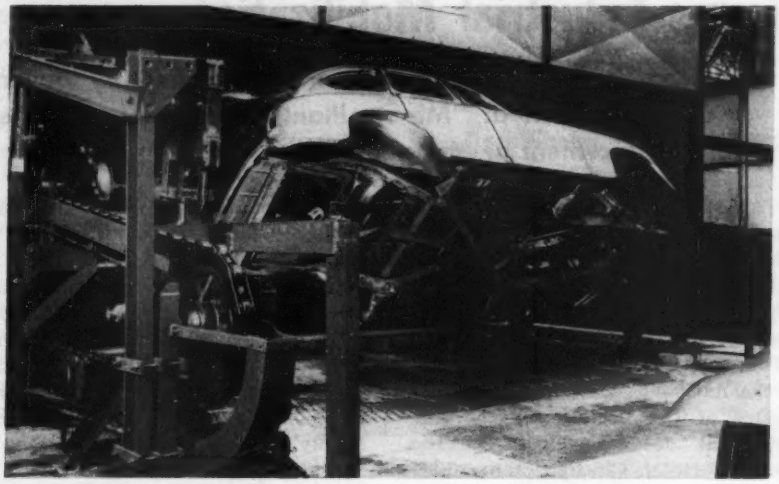
PLAN CAR MOBILIZATION: Despite supersonic air speeds, modern warfare still depends on rail haulage for mass tonnages. In recognition of this, the National Security Resources Board invited this group of freight car builders to advise on developing mobilization plans in event of another emergency. Shown at the conference, left to right: Sam Laud, General American Transportation Co., Chicago; Charles S. Hanley, Pressed Steel Car Co., Pittsburgh; Fred Norton, American Car & Foundry Co., New York; Gunther Froebel, NSRB; Joseph Angsten, Pullman-Standard Car Mfg. Co., Chicago; Stephen Early, Pullman-Standard; Robert J. Holland, NSRB

Business Weather Shifts

In Western Europe as prices, competition show signs of reappearing as economic factors

SIGNS of changes in the economic weather have been noted on Western Europe's business horizons.

The price barometer for European steel markets has fallen slightly as the result of competitive pressures. Britain is freely offering medium heavy plates on the Continent at the lowest prices prevailing. Belgian domestic users are easing their steel demands, and unemployment has risen a little in that country. The French have stepped up their steel export drive and have cancelled steel import orders previously placed in Belgium and in the Ruhr. Tighter credit restrictions have slowed business in Western Germany.



AUTO ON A SPIT: Fisher & Ludlow Ltd., automobile body plant at Castle Bromwich, Eng., features a rotodip plant to clean, coat with phosphate and prime paint bodies. Before processing, the bodies are placed on a "spit" and rotated through the various treatments

Belgium

BELGIAN foundries and metallic construction, textile, glass and paper industries are paring their payrolls because of declining export demand.

Other factors accounting in part for unemployment situation are the improved worker efficiency since the war's end and a labor pool larger than before the war. The general situation, however, does not call for storm warnings. During 1948 the nation's exports were 90 per cent of her imports.

Belgian pig iron exports are encountering stiffer competition from Germany, the Netherlands, France, Sweden, Norway and Italy. Demand from the United States has been substantial. Steel exports are also active to the United Kingdom, Portugal and Belgian Congo. As a step to stimulate these exports still further, the Belgian government will stop for 1949 the 3 per cent export tax established in 1948. The country is also seeking an international conference on currency stabilization.

The output of steel ingots in Belgium in November was 346,540 metric tons, against 366,510 tons in October. At the end of the month 48 blast furnaces were in operation. In Luxemburg, the output of steel ingots was 224,200 tons during the month, compared with 223,712 tons in October. Luxemburg has 25 blast furnaces in operation, against 23 previously.

Western Germany

TIGHTENING credits in Western Germany have particularly affected building and heavy industries, including railways.

Railroads have already cancelled many equipment orders; the coal industry has curtailed its machinery orders and is also slow in paying for what it is now getting. As the result of these developments, Ruhr steel producers are beginning to urge for more steel exports. Industrialists point out that Germany must keep up at least some of its foreign contacts for future reference and that warmth from the sun still shining in the international steel market might thaw the domestic credit freeze.

Bizonia made 3,620,000 tons of rolled steel products in 1948, compared with 2,100,000 tons in 1947. Coal production reached 87 million tons, as against 71 million tons in 1947. Coke output rose from 13 million to 19 million tons in 1948. German industrialists are speculating on reported plans of the World Bank to invest about $300 million in the Ruhr. An estimated $500 million would be necessary in order to rehabilitate the region to an annual capacity of 19 million tons of steel.

Plans to strengthen the links between the iron ore field of Lorraine and the Ruhr industry have been announced by a mixed group of German, French and Luxemburg chambers of commerce. Program calls for a series of canals to make the Moselle river navigable, enabling vesseis up to 1000 tons to travel between the two industrial districts. The project, developed by the French engineer, Rene Malco, would take about eight years to complete, would cost $50 million and will be placed before the OEEC in Paris for possible Marshall Plan financing. The canal system will not include the Saar.

India

INDIA will spend about $60 million in United States for iron and steel manufacturing plants and fabricated steel frames in 1949, 1950 and 1951. India's total expenditures in the U. S. during the period will reach $500 million, mostly for capital goods, according to Ramji Ram Saksena, Indian Consul General in New York who has prepared a study on the subject for *The Times of India*.

Part of India's industrialization program is the construction of several hydroelectric projects. The nation's present steel capacity of 2 million tons annually will be doubled as part of the plan. Products to be purchased in the U. S. include railroad equipment, trucks, ships, machine tools, electrical machinery, office machinery, paper and pulp mill plants. To encourage industrialization, the government has drastically reduced the import duty on plant machinery and new industry has been given many income tax reductions.

Brazil

LONG-TERM licensing agreement between Westinghouse Electric International Co. and Eletromar, an electrical manufacturing company in Brazil, has been signed. As a result of the agreement, Eletromar will expand an existing factory in Rio de Janeiro and in addition will build a new plant to manufacture lamps.

Discuss Industrial Mobilization

Emergency preparedness planning explained by government spokesmen at "Minute Plant" conference of Society for Advancement of Management

TO AVOID a national epitaph reading "too little, too late," plans for industrial mobilization must be formulated and requirements of the military services well understood in advance of a national emergency.

This was the tenor of discussions at the national "Minute Plant" conference of the Society for the Advancement of Management at the Sheraton Hotel, Chicago, Jan. 20-22.

Past experience demonstrated weakness does not prevent war, said Brig. Gen. Donald Armstrong, president, United States Pipe & Foundry Co., and consultant to the National Security Resources Board, the keynote speaker. Maj. Gen. Patrick W. Timberlake, director of military requirements and facilities of the Munitions Board, warned "there is not a remote chance a third aggressor will repeat the colossal mistake of giving us time to get ready for war."

Defects Found—General Armstrong blamed wartime delay in industrial mobilization on four factors: Mobilization was based on the M-Day concept; plans were prepared by the Army and Navy without industrial co-operation; plans were almost exclusively on paper without an organizational nucleus in being; and existing plans were not well enough known.

Two plans to slash the time required for full-scale war production were described by General Timberlake. Labeled the War Requirements Program and the Facilities Allocation Program, they spell out military establishment needs and who would supply them.

Starting with the Joint Chiefs of Staff's "strategic concept," the Munitions Board will total each service's requirements by classes of items to determine whether the strategic plan is feasible and whether industry can fill the bill.

The more important phase of mobilization from industry's standpoint is the Facilities Allocation Program. Under this plan each plant has a single military officer who supervises military contracts, surveys the plant for its ability to produce a required item and co-ordinates placement of tentative orders and production schedules.

Some Capacity Not Allocated—Certain types of industry will not come under plant allocation, including facilities producing raw and basic processed materials such as steel, copper and aluminum; food processing plants; capacity for industrial equipment such as machine tools, forgings and presses; and capacity for certain products widely used in both civilian and military fields such as bearings, small electric motors, nuts and bolts.

Actions To Minimize Time Lag—Advance planning has already eliminated some time-consuming activities found necessary in the last war, the general pointed out. In the Military Industrial Reserve Program and the National Industrial Reserve Program, 157 and 241 plants, respectively, are now kept in readiness for war. In addition, 506 war-built plants have been sold or leased to industry and are now in production of their designed war products. Thus 904 facilities, representing $10.9 billion in cost, are in varying degrees of readiness.

Paralleling the two plant programs are the machine tool programs. The military reserve has authority to hold 182,000 machine tools. Already 115,400 units are in military warehouses and shipping orders have been issued on approximately 24,000 more. The national reserve, with authority for holding 50,000 tools, has 5693 covered by shipping orders, with 2904 of these already stored.

NEW COLD MILL: Requiring two years to build at a cost of $2½ million, this unit represents an investment of $62,500 per employee. The 14 x 33 x 22-inch cold reduction mill, just placed in operation by Acme Steel Co. at Riverdale, Ill., will process strip up to 18¼ inches in width in gages of 0.006 to 0.020-inch at speeds up to 3000 feet per minute. Atmosphere throughout the motor room and electrical basement is cleaned

Meetings . . .

Jan. 31-Feb. 4, American Institute of Electrical Engineers: Winter general meeting, Hotel Statler, New York. Institute headquarters are at 33 W. 39th St., New York.

Feb. 3-4, Electric Maintenance Engineers of Milwaukee: Tenth annual industrial electrical equipment exposition, Public Service Bldg., Milwaukee.

Feb. 7-8, National Association of Purchasing Agents: Mid-winter conference on public utility buying, Edgewater Beach Hotel, Chicago. Association headquarters are at 11 Park Place, New York.

Feb. 7-9, American Road Builders' Association: 46th annual meeting at Hotels Mayflower, Statler and Willard, Washington. Association headquarters are in the International Bldg., Washington.

Feb. 7-11, Automotive Accessories Manufacturers of America: Convention in Philadelphia. Association headquarters are at 501 Hardt Bldg., Philadelphia.

Feb. 10-11, Twelfth Annual Regional Foundry Conference: Sponsored by Wisconsin chapter of American Foundrymen's Association and University of Wisconsin, at Hotel Schroeder, Milwaukee.

Feb. 13-17, American Institute of Mining & Metallurgical Engineers: General meeting, San Francisco.

Feb. 14-15, Edison Electric Institute: Convention at St. Louis. Institute headquarters are at 420 Lexington Ave., New York.

Feb. 21-22, Purdue University and Material Handling Institute: Materials handling conference on Purdue campus at Lafayette, Ind.

Feb. 28-Mar. 4, American Society for Testing Materials: Spring meeting and committee week, Hotel Edgewater Beach, Chicago. Society headquarters are at 1916 Race St., Philadelphia.

Mar. 3-5, American Society of Training Directors: Fifth annual conference, Hotel Carter, Cleveland. Society headquarters are at 705 Fidelity Bldg., Cleveland.

ICC Reports to Congress

That rate increases may be carried to point where they are largely self-defeating

RATE increases may be carried to the point where they are largely self-defeating, the Interstate Commerce Commission told Congress in its annual report. Pointing out that rail freight rates rose 44 per cent between June 30, 1946, and last November, with an additional average raise of 5.2 per cent since then, pending the commission's decision on a plea for a 13 per cent boost, the ICC warned that continuing and large advances in rates work changes in the national economy which on the whole should be avoided where possible.

Although it is aware of the effect of increased rates on the general condition of inflation, the ICC added that no alternative to large and successive rate increases existed if the railroads were to maintain adequate rail service in peace and in national emergencies. Changes ranging from those required in a multitude of day to day operations to large scale changes calling for careful planning and substantial capital investments, must be made to reduce the costs of railroad operation and increase their efficiency, the ICC stated.

Intercity motor carriers hauled a larger volume of traffic in 1948 than in any other period because of a high level of production and new diversions from the railroads for reasons of rate and service considerations, the commission further reported. Water carriers in the coastwise, intercoastal and Great Lakes trade have not been able to make much progress in dealing with the difficult conditions, including high costs, which have confronted them since the war, and in some respects the prewar pattern of operations may be beyond restoration for them, the ICC believes.

It appears reasonable to question whether continued use of for-hire carriers for tax collecting purposes is justified, the report adds, since this tax discriminates against long haul shippers in reaching common markets in competition with short haul shippers. This tax which put close to $564 million in the treasury during the fiscal year ended June 30, 1948, also adds to the difficulties of trucking firms in competition with companies delivering products in their own trucks since the latter are not assessed the 3 per cent tax.

Handlers Group Elects Officers

OFFICERS were elected at a meeting of Material Handling chapters in Philadelphia where American Materials Handling Society, to which all chapters will now belong, was incorporated, according to an announcement by Material Handling Institute Inc., Pittsburgh.

President is Walter A. Metcalf, Boston; vice president, R. N. Burgess, Detroit; secretary, Irving M. Footlik, Chicago; and treasurer, W. W. Phillips, Indianapolis.

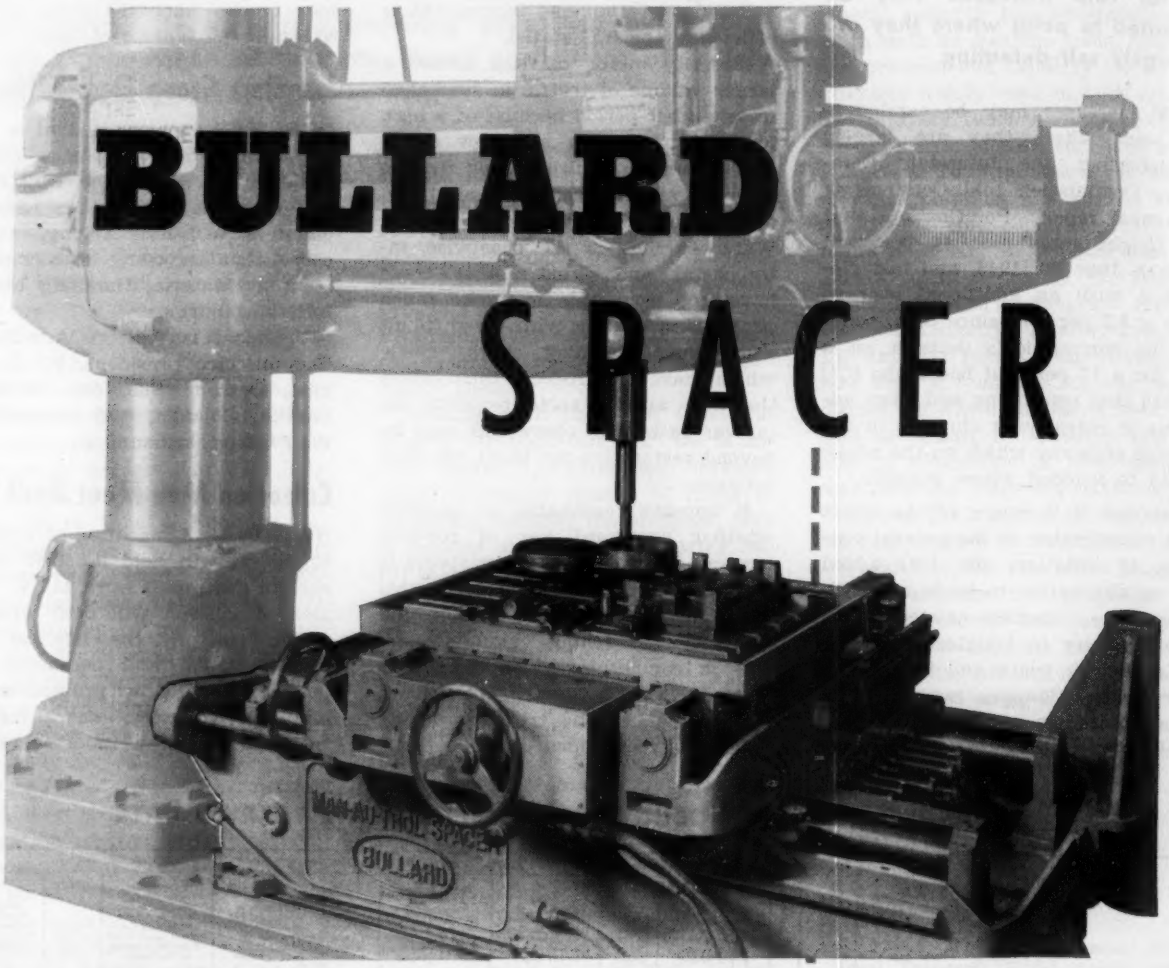
Corrosion Men Meet April 11-14

NATIONAL Association of Corrosion Engineers will hold its 1949 conference in Cincinnati April 11-14. Technical discussion will deal with corrosion principles, the chemical industry, electrical and communications industries, cathodic protection, pulp and paper industry, general industry, the transportation industry, etc.

SHIPMENTS OF STEEL PRODUCTS FOR NOVEMBER AND YEAR TO DATE

Steel Products	Number of Companies	Items	NOVEMBER - 1948			To Date This Year			Whole Year 1947		
			Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale) (Net Tons)	Per cent of Total Shipments	Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale (Net Tons)	Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale) (Net Tons)	Per cent of Total Shipments	Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale (Net Tons)	Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale) (Net Tons)	Per cent of Total Shipments	Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale (Net Tons)
Ingots, blooms, billets, tube rounds, sheet and tin bars, etc.	45	1	284,905	5.0	270,945	2,857,161	4.8	2,991,958	2,966,748	4.7	2,396,343
Structural shapes (heavy)	12	2	368,130	6.4	1,892	3,861,471	6.5	22,873	4,436,129	7.0	2,640
Steel piling	4	3	23,087	0.4	111	269,054	0.5	1,435	324,224	0.5	23
Plates (sheared and universal)	29	4	629,475	11.0	25,438	6,342,426	10.6	335,563	6,345,216	10.1	219,227
Skelp	7	5	7,361	0.1	45,016	67,071	0.1	480,140	160,989	0.3	384,004
Rails—Standard (over 60 lbs.)	4	6	175,407	3.1	1,537	1,805,703	3.0	12,273	2,207,146	3.5	991
—All other	5	7	14,507	0.3	44	195,846	0.3	1,035	211,900	0.3	329
Joint bars	7	8	10,557	0.2	5,039	124,304	0.2	39,436	173,923	0.3	15,198
Tie plates	7	9	39,234	0.7	31	447,783	0.8	369	504,779	0.8	4,437
Track spikes	8	10	13,013	0.2	32	132,206	0.2	605	163,746	0.3	146
Hot Rolled Bars—Carbon	34	11	533,608	9.3	56,773	5,639,128	9.4	568,914	6,242,416	9.9	745,770
—Reinforcing—New billet	16	12	103,615	1.8	740	1,212,063	2.0	6,442	1,277,075	2.0	9,775
—Rerolled	13	13	15,547	0.3	-	195,833	0.4	-	175,833	0.3	-
—Alloy	27	14	164,501	2.9	18,364	1,739,512	2.9	205,118	1,741,432	2.8	212,382
—Total	44	15	817,271	14.3	75,877	8,784,536	14.7	780,474	9,436,756	15.0	967,927
Cold Finished Bars—Carbon	28	16	119,405	2.1	579	1,225,124	2.0	6,096	1,426,701	2.3	9,249
—Alloy	27	17	24,891	0.4	667	218,264	0.4	5,717	218,802	0.3	2,601
—Total	35	18	144,296	2.5	1,246	1,443,388	2.4	12,813	1,645,503	2.6	11,850
Tool steel bars	18	19	8,383	0.2	33	81,191	0.1	1,444	87,279	0.1	1,670
Pipe & Tubes—Butt weld	16	20	185,891	3.3	2,567	1,845,466	3.1	25,637	1,892,691	3.0	78,080
—Lap weld	8	21	27,980	0.5	-	311,617	0.5	3	389,762	0.6	875
—Electric weld	13	22	134,041	2.3	393	1,432,006	2.4	4,801	1,254,325	2.0	4,274
—Seamless	17	23	266,141	4.6	13,149	2,655,598	4.4	153,222	2,581,106	4.1	157,208
Wire rods	22	24	24,312	0.4	22,273	528,473	0.9	275,268	667,282	1.1	331,192
Wire—Drawn	39	25	258,482	4.5	14,441	2,461,247	4.1	161,108	2,590,963	4.1	181,783
—Nails and staples	17	26	70,700	1.2	1,065	786,634	1.3	11,932	799,436	1.3	8,481
—Barbed and twisted	15	27	21,123	0.4	3	231,514	0.4	429	256,991	0.4	128
—Woven wire fence	13	28	33,979	0.6	438	365,498	0.6	3,538	407,295	0.6	3,616
—Bale ties	11	29	7,983	0.1	-	107,334	0.2	-	119,917	0.2	-
Black Plate—Ordinary	9	30	69,395	1.2	-	740,811	1.2	654	801,745	1.3	2,033
—Chemically treated	2	31	2,103	-	-	14,545	-	-	19,252	-	-
Tin and Terne Plate—Hot dipped	9	32	170,758	3.0	-	1,946,480	3.3	259	2,095,149	3.3	228
—Electrolytic	9	33	144,435	2.5	-	1,606,043	2.7	215	1,617,659	2.6	529
Sheets—Hot rolled	32	34	666,631	11.6	54,315	7,078,570	11.8	583,139	7,891,798	12.5	578,426
—Cold rolled	16	35	608,448	10.6	2,406	6,238,628	10.4	19,280	5,504,578	8.7	28,498
—Galvanized	16	36	142,951	2.5	317	1,503,654	2.5	2,736	1,609,881	2.5	889
Strip—Hot rolled	23	37	145,554	2.5	32,381	1,519,839	2.5	339,982	1,740,085	2.7	308,655
—Cold rolled	34	38	165,304	2.9	1,633	1,627,380	2.7	22,168	1,613,005	2.6	28,030
Wheels (car, rolled steel)	5	39	29,758	0.5	58	306,413	0.5	1,004	356,873	0.6	2
Axles	5	40	20,681	0.4	25	195,481	0.3	143	185,019	0.3	53
All other	-	41	-	-	-	-	-	-	-	-	-
TOTAL STEEL PRODUCTS	140	42	5,732,256	100.0	572,705	59,915,371	100.0	6,285,936	63,057,150	100.0	5,717,765

BULLARD SPACER



ELIMINATES . . .

Hole-Locating Jigs and Fixtures

This unit applied to radial drills having accurate drill spindles, is proving a highly successful cost reducing method for drilling short or long run jobs without the need for expensive jigs or fixtures.

It is competitively accurate and in many cases faster than conventional jig borers.

Drilling, boring, reaming and tapping operations have been speeded up and costs reduced by many users of this equipment.

To meet the future economic pressure investigate this manufacturing method. Ask BULLARD Engineers about satisfied users. Write today.

•

THE BULLARD COMPANY
BRIDGEPORT 2, CONNECTICUT

Illustrated...
30 x 20 SPACER

— Bullard 30 x 20 Spacer processing three different parts in one set up. All pieces located within ± .0005. Such a set up is especially profitable on small lot production.

BULLARD

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

General Motors technical center, once deferred because of high construction costs, reactivated. Building to start soon on 350-acre site northeast of Detroit

DETROIT

FIRST announced in July, 1945, and later put on the shelf because of what were considered excessive construction costs, the $20 million General Motors technical center to be built on a 350-acre site a few miles outside of northeast Detroit has been reactivated, in part at least, and construction work is scheduled to start at an early date. As originally conceived, the various buildings comprising the center will be grouped around a central esplanade within which will be a 7-acre lake (still to be dug) and the entire project will be purely a technical fact-finding and experimental development activity, with no direct product responsibility for any of the corporation's several manufacturing divisions.

Proposed structures to be included in the center are a central administration building, with 1000-foot frontage, and advanced engineering building, research laboratories, styling section and process development department. Architecture is described as contemporary functional, although it embodies many radical departures from the conventional. Buildings, for example, are all to be set on a terrace, built up by excavation for the lake, so that ground-level drive-ins may be provided.

Last of Postwar Projects — The technical center is about the last major postwar addition to facilities on the GM agenda, and its deferment until other manufacturing and assembly projects were out of the way was a logical move.

Peak capacity of all GM car and truck building divisions, United States and Canada, currently has been boosted to 12,500 units daily, comparing with a 1941 top of 11,000 and maximum output last year of 9000 daily. It is not expected the new peak will be reached at any time this year; the corporation would be satisfied if a pace of 10,000 daily could be held.

GM Officials Optimistic—Certainly GM officials exuded optimism at their recent New York show. C. E. Wilson, president, saw the possibility of a 6,000,000-unit production this year, declared the market for cars is now 25 per cent greater than prewar, said his divisions had no plans for lower-priced models, looked for little or no change in prices this year, opined there would be a big demand for cars, "when the sun starts to shine in the spring."

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

	1948	1947
January	422,236	366,207
February	399,471	393,636
March	519,154	443,588
April	462,323	445,133
May	359,996	404,190
June	454,401	421,466
July	489,736	400,944
August	478,146	364,958
September	437,181	444,500
October	516,843	461,536
November	495,918	417,492
December	500,000*	492,819
12 mos.	5,535,405*	5,056,474

* Preliminary.

Estimate for week ended:

	1949	(same week) 1948
Jan. 8	98,422	111,276
Jan. 15	112,587	109,031
Jan. 22	114,247	110,774
Jan. 29	120,000	101,044

Ward's Automotive Reports

Be that as it may, there was plenty of jockeying for the public's attention between Chevrolet and Pontiac at the show, since it was the first appearance of 1949 models for both these divisions.

New Pontiac Data—For the record, it might be pointed out the 1949 Pontiacs offer essentially the same body styles as the Chevrolet, except that they have been stretched out a little. Wheelbase is standardized at 120 inches, overall length 202½ inches, height down 2½ inches. Interiors are wider but exterior width has been cut almost 3 inches. Engines for both sixes and eights are unchanged, although a high compression head is available to bring compression ratio up to 7.5 to 1. Hoods and radiators are lower, necessitating redesign of the water pump and fan to reduce blade whine at high speeds. A permanently lubricated inner clutch countershaft bearing has been developed to insure against clutch pedal rattle. Steering wheel rigidity has been improved by increasing the column jacket diameter from 1½ inches to 2 inches and wall thickness by 70 per cent. New in the Pontiac lineup is a sedan delivery commercial car and an all-steel station wagon. Prices, incidentally, are up $40-$60 over 1948, except for the convertible which has been increased $135.

High-Octane Gas Development

TO ASSIST petroleum refiners in their studies incident to the development of higher-octane gasolines, General Motors research laboratories will build high-compression test engines outfitted with three sets of cylinder heads and other parts so they can operate at 8, 10 and 12 to 1 compression ratios. It was realized at the start of GM's high-compression engine program that compression ratios would have to be increased in steps only as higher octane fuels became available. The latter is of course predicated on a considerable amount of co-operative research between petroleum and automotive industries to fit the fuel to the engine and vice versa. The engine which GM research is supplying the oil companies is essentially a 7.25 to 1 Oldsmobile power plant redesigned for 12 to 1 operation, thereby providing a pilot model representing a production type engine of the truly high compression variety. Together with orders for test engines, the petroleum companies also are obtaining current models of Olds cars equipped with the new engine, permitting both dynamometer testing and road testing.

Five Modifications Included—Five modifications of the present Olds engine are furnished in the "package" for petroleum research organizations: (1) Three sets of cylinder heads to permit operation at the three stated compression ratios; (2) connecting rods which have been given special heat treatment to withstand greater bearing loads; (3) new pistons and pins with higher strength characteristics; (4) chromium plated piston rings; and (5) a larger distributor and a redesigned ignition coil for

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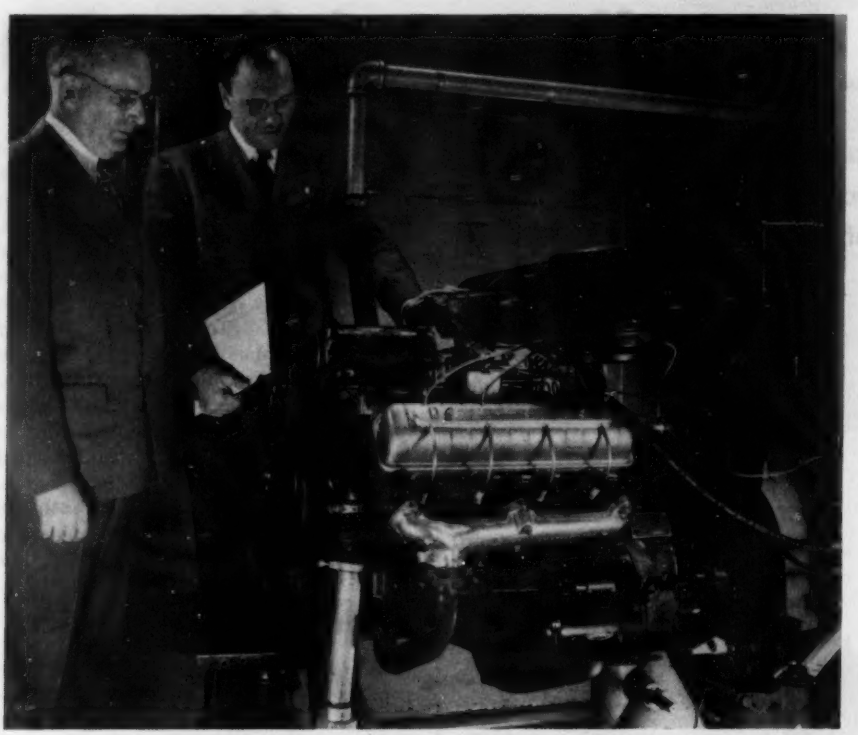


General Motors research V-8 high compression automotive engine mounted on a laboratory dynamometer is shown being inspected by Charles L. McCuen, left, GM vice president and general manager of the research laboratories, and Darl F. Caris, head of the GM research advance engine department. GM research will supply these 12-to-1 compression ratio engines, modifications of the Olds Rocket engine, to petroleum companies for their research on future high-octane fuels. The test engines are equipped with cylinder heads and other parts suitable for operation at 8, 10 and 12-to-1 compression ratios.

higher secondary voltages—standard 6-volt source is satisfactory.

In the 12 to 1 compression ratio version, the engine requires a higher voltage across the spark plug gap because of the higher compression pressures involved. This, in turn, entailed a redesigned ignition coil to deliver higher secondary voltages, as well as a larger diameter distributor to eliminate cross firing.

Hydra-matic or Dynaflow?

THE AUTOMATIC transmission specialists were as thick as flies at the session of the recent SAE meeting here when Oliver (O. K.) Kelley, engineer in charge of transmission development for General Motors, reviewed the development of these devices for motor vehicles, both in this country and abroad. They were curious to see whether he was going to give the orchids to the step-type hydra-matic transmission used by Cadillac, Olds and Pontiac, or to the infinitely-variable torque- converter dynaflow design introduced by Buick and scheduled to appear in a less-costly version on Chevrolet. After all, they reasoned, Kelley had been intimately associated with the development of both types, so he should know the score.

Upshot was that after awarding a large bouquet to the hydra-matic—"its combination of planetary gears and friction elements operated automatically through a hydraulic presure control system continues to astound the engineers"—he concluded that the torque converter, or at least a combination of the best features of the torque converter and the hydra-matic, would be the ultimate solution in the matter.

Specifically, he stated, "The inherent smoothness of the converter drive obviates the necessity for the torsion damper in the drive system. Backlash takeup between drive and coast is smooth and noiseless, and there is a definite improvement in the tendency to skid the rear wheels on slippery roads when coasting without the brakes on and turning around a corner. At low speeds when sharper turns are taken the rear wheels are almost free-wheeling and thus retain their rotation and their sense of direction. In general, a pleasing smoothness of a car operation results which, coupled with the flexibility of power, transforms an automobile more extensively than any other mechanical design change ever made."

Despite the inherent reliability of the torque converter, it has its limitations in that a compromise is necessary between the desired efficiency at different operating speeds. As Kelley stated, it is not easy to accomplish efficient cruising with a converter capable of high efficiency at great torque multiplication, and engineers responsible for the final decision have to balance the solution according to their best judgment. Chief speculation now centers on what will be done in the transmission behind the converter by the various companies now working on this type of drive.

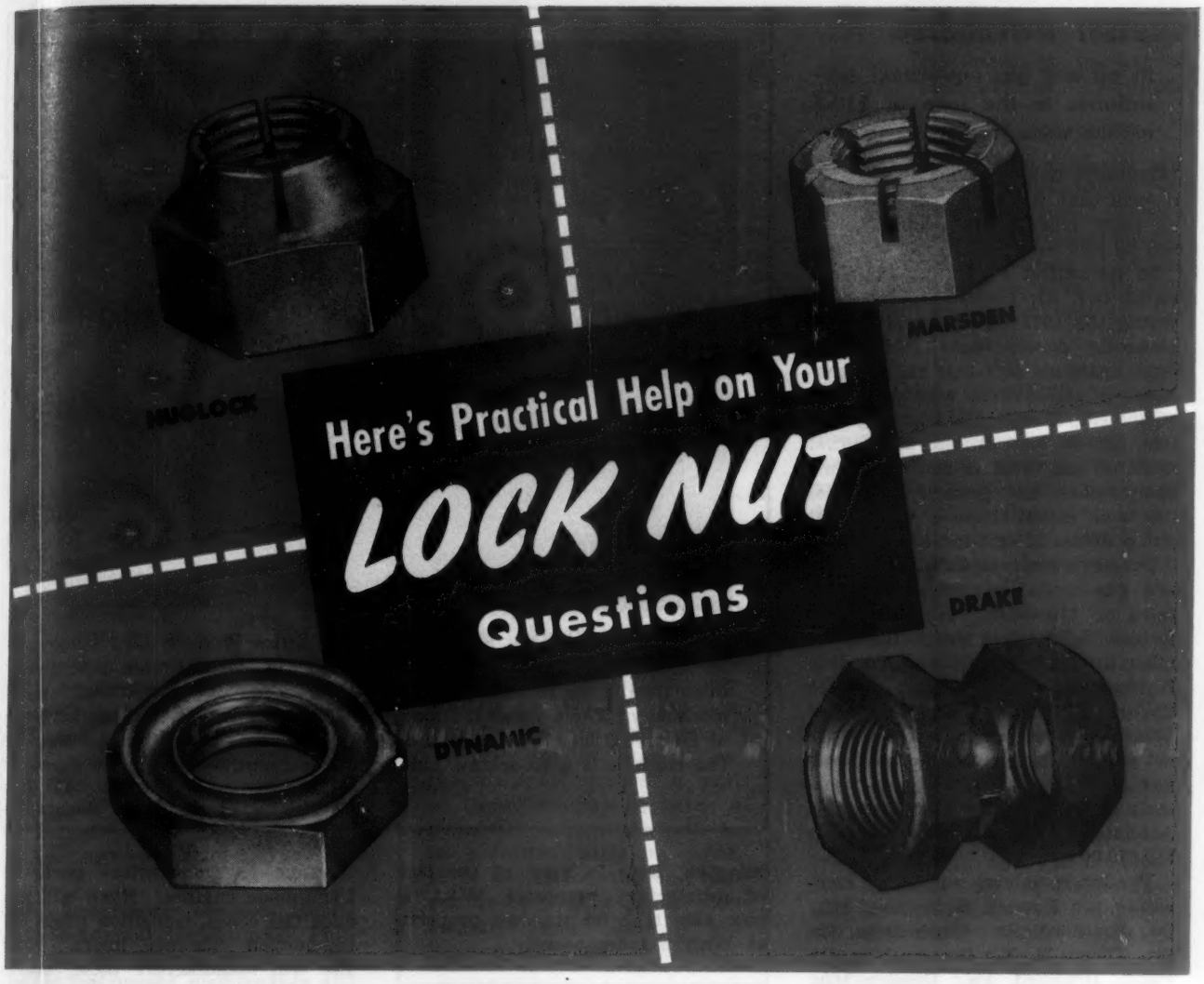
Labor Turnover Down

RATE of labor turnover last year at the Rouge Plant of Ford Motor Co. decreased for the third straight year. Based on separations and excluding permanent layoffs, labor turnover for hourly personnel averaged only 1.9 per cent per month, compared with 2.1 per cent in 1947 and 2.7 per cent for 1946. For the lowest single month last year, April, it was only 0.99. There were 2177 fewer voluntary quits at the Rouge plant last year, and the employment office hired 3063 fewer persons to maintain the operating force. Hourly employment at the end of last December totaled 63,-154.

Nash Has Best Year

SUMMARY of Nash-Kelvinator operations for the year ended Sept. 30 showed production, sales and earnings greater than in any year since the consolidation of Nash and Kelvinator in 1937. Sales, at nearly $303 million, were 20 per cent ahead of the previous year; earnings, equivalent to $4.63 per common share, were up 11 per cent; dividend payments increased 60 per cent. However, profit margin per dollar of sales declined to 6.6 per cent as against 7.2 in 1947.

Nash automotive production, at 119,862 units, was 3.4 per cent greater than in the preceding fiscal year, while Kelvinator appliance production rose to 770,490 units, up 15.4 per cent. A long-range program of plant expansion and improvement, started just after the war, was continued during the 1948 fiscal year, with expenditure of $12.7 million, bringing the total postwar account for new facilities, tooling, equipment and modernization to $38.6 million. The program is not yet complete, and substantial additional funds are being spent this year.



Every problem of vibration and loosening of parts calls for careful study to find just the right answer. "National" engineers have encountered just about every type of problem, and our line of Lock Nuts is designed to meet an unusually wide range of requirements. The booklet illustrated here contains much useful data and should be helpful in determining type, size and cost of lock nuts for a given application. A copy will be sent on request.

Other "National" products:
HODELL CHAINS,
CHESTER HOISTS.

For heavy duty — National's "Drake" Lock Nut withstands severe stress, shock or vibration. A two-piece, positive lock for use on rugged, heavy equipment, where size and weight are not a factor.

To withstand shear only — National's "Dynamic" Lock Nut is a thin, lightweight nut with diaphragm lock, for use where clearance is a factor and where strains are in shear only.

For shock-loading or vibration, even under heat, oil or moisture, National's "Huglock" Lock Nut is a one-piece, all-metal lock nut. Easily installed, it grips the bolt threads and maintains locking effect whether seated or not.

For effective, low-cost locking. National's "Marsden" Lock Nut is a one-piece, cantilever action type, easily applied, free running until seated. For the most complete line of standard and special fasteners, come to "National".

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Dresser Modernizes

Its oil and gas equipment subsidiaries to the tune of $10.5 million since the war

DRESSER Industries Inc., Cleveland, reports that it has spent $2,003,000 on plant modernization and $8,532,000 on new machinery since the war.

In its annual report for the year ended Oct. 31, Dresser reveals that during the 1948 fiscal period its engineering developments included a light hydraulic shot-hole rig for geophysical exploration, mobile drilling equipment, a hydraulic pumping system, new oil well drilling bits, initial work on gas turbines and axial flow compressors for general industrial use and steam turbine centrifugal pump drives of unitized construction.

Dresser's ten companies making oil and gas capital equipment produced sales of $79,465,637 in 1948 which yielded $5,792,108 in net profit. Three other firms—Bryant Heater Co., Day & Night Mfg. Co., Payne Furnace Co.—accounted for $20,171,260 of Dresser's sales and $2,246,314 of its net profit. These makers of domestic gas heating appliances were sold early this month to the newly formed Affiliated Gas Equipment Inc., for $10,870,000.

The ten remaining subsidiary companies are Bovaird & Seyfang Mfg. Co., Bradford, Pa.; Clark Bros. Co. Inc., Olean, N. Y.; Dresser Mfg. Division, Bradford, Pa.; Dresser Mfg. Co. Ltd., Toronto, Ont., Canada; International Derrick & Equipment Co., Columbus, O.; Kobe Inc., Huntington Park, Calif.; Pacific Pumps Inc., Huntington Park, Calif.; Roots-Connersville Blower Corp., Connersville, Ind.; Security Engineering Co. Inc., Whittier, Calif.; Stacey Bros. Gas Construction Co., Cincinnati.

STUDS OF CARBON STEEL: Lundberg Screw Products Co., Lansing, Mich., is using cold-finished carbon steel bars in place of more expensive alloy steel in the manufacture of certain studs for automotive and farm machinery. Photo shows Lundberg men making a test on stud fabricated of Electreat, Jones & Laughlin Steel Corp.'s cold-finished carbon steel. The machine is a six-spindle automatic screw machine, made by Acme-Gridley, Cleveland

WAA Rejects Warren Plant Bid

NO satisfactory bids have been received for the disposal of the combined government-owned and privately-owned steel facilities at Warren, O., operated during the war by Copperweld Steel Co., War Assets Administration has announced.

WAA will now enter into negotiations with any who wish either the two plants combined or just the government portion. Warren-Ohio Steel Co., a new firm headed by Paul V. McNutt who is backed by New York financial interests, had earlier expressed a wish to negotiate if no bid was accepted.

The only bid received for the plant was one of $10,400,000 submitted by Penn-Warren Steel Corp., Wilmington, Del. In view of the lack of satisfactory proposals, WAA is now able to offer its own property at Warren independently.

Railroad Track Firms Combine

NEGOTIATIONS to combine Taylor-Wharton Iron & Steel Co., High Bridge, N. J., and Weir Kilby Corp., Cincinnati, have been completed. The move involves an exchange of stock.

Taylor - Wharton manufactures manganese and other alloy steel castings, track work and gas cylinders. Weir Kilby produces track work for steam railroads. Both companies retain their separate corporate names and management, and current policies will be continued. G. R. Hanks is president of Taylor-Wharton and O. DeGray Vanderbilt Jr. is president of Weir Kilby.

GE Awards Jet Parts Contracts

GENERAL Electric Co. has awarded contracts for the manufacture of aircraft jet engine parts to Solar Aircraft Co. and Ryan Aeronautical Co., both of San Diego, Calif.

The San Diego-made parts will be shipped for assembly to GE's newly acquired plant in Lockland, O., when the facility begins production of J-47 jet engines early this year. The company's Lynn River, Mass., works will continue to manufacture parts for Lynn-made engines. Ryan will produce tail cones, transition liners and combustion chamber liners. Solar also will manufacture these, but in addition will produce aft frames and combustion chambers. All engine parts and auxiliaries for engines produced at Lockland will be manufactured by subcontractors.

Instel Metals Corp. Formed

INSTEL Metals Corp. has been formed as an affiliate of International Selling Corp., New York, to deal in nonferrous metals, steel, ores and minerals, ferroalloy and scrap.

Activities of International Selling have been in the fields of metals and ores, chemicals and machinery. Metal and ore business will be transferred to the new company which has established representation with producers of aluminum, lead and lead alloys, zinc, copper and steel; with miners of lead, copper, chrome, iron, graphite, bauxite and other metals; as well as with nonferrous metal fabricators.

Officers of Instel Metals are W. F. Brazeau, president; Sylvan Gotshal, chairman of the board; J. E. Vincent, vice president; and Carl Bauer, secretary-treasurer. Mr. Brazeau also is president of the parent firm.

Briefs . . . .

Paragraph mentions of developments of interest and significance within the metalworking industry

G. A. Gray Co., Cincinnati, builder of machine tools, has appointed W. E. Shipley Machinery Co., Philadelphia, as distributor for the Philadelphia and Baltimore territories. Vandyck Churchill Co., New York, has been named distributor for eastern New York, southern Connecticut, northern New Jersey and northeastern Pennsylvania. E. A. Kinsey Co., Cincinnati, will serve in a similar capacity in southern Ohio, Kentucky and western West Virginia.

—o—

Oakite Products Inc., New York, will celebrate its 40th anniversary during February. Since its founding with only one cleaning material in 1909, the company has expanded until it now offers over 80 diversified cleaning and related compounds.

—o—

McLouth Steel Corp., Detroit, has awarded Westinghouse Electric Corp. a contract to build a $1 million electric drive for its new 42-in. hot strip finishing mill. Drive equipment will include a 5000 hp motor, a 4000 kw motor-generator set and about 300 auxiliary motors of 2 to 300 hp.

—o—

Brown Instruments Division, Minneapolis-Honeywell Regulator Co., Philadelphia, will conduct classes on industrial instrument maintenance and repair during the first half of this year. Classes for the benefit of industry will be of five weeks' duration and longer courses will be offered for company personnel.

—o—

Tidewater Steel Drum Co., Baltimore, engaged in the reconditioning of metal containers, has changed its name to Admiral Steel Drum Co.

—o—

Baltimore Instrument Co., Baltimore, has moved into larger quarters at 716-718 West Redwood St. The company makes and repairs surgical, scientific and laboratory instruments.

—o—

Pennsylvania Salt Mfg. Co., Philadelphia, announces opening of a sales office in Appleton, Wis., for its Heavy Chemicals Division. C. H. Anderson, formerly of the Chicago office, has been placed in charge as district sales manager.

—o—

Open Hearth Combustion Co., Chicago, has become a subsidiary of Freyn Engineering Co. of the same city. Although the two concerns will function as independent units, general offices of Open Hearth will be moved to 109 N. Wabash Ave., Freyn's location.

—o—

Vapor Heating Corp., Chicago, manufacturer of train heating equipment and automatic steam generators used by the railroads, is opening an office in Houston, Tex. J. T. Elwood will work out of the new office serving railroads in Texas and Louisiana.

—o—

Miami Valley Distributors Inc. has been chartered in Columbus, O., to handle Avco Mfg. Co. sales in that city and central Ohio. Products handled for Avco's Crosley Division will include radios, television sets and household appliances.

BRIGGS BUYS OHIO PLANT

BRIGGS Mfg. Co., Detroit, which was considering a plant in the Pittsburgh district last fall has instead bought the Upper Union Mills of Carnegie-Illinois Steel Corp. in Youngstown, according to W. D. Robinson, president of the firm.

Work will be started immediately to remodel a part of three buildings to house a stamping plant which will be in operation early in April. It is understood the unit will get about 4000 tons of steel monthly from Carnegie and Youngstown Sheet & Tube Co.

—o—

Multiplex Concrete Machinery Corp., Elmore, O., has as its new president Lawrence J. Holzman, former vice president in charge of sales, Parsons Engineering Corp. Mr. Holzman recently acquired control of the firm. Frank Muenzer, former president of the firm, will remain in an advisory capacity on research and development as a vice president.

—o—

Foundry Equipment Co., Cleveland, has purchased the industrial oven business of Young Bros. Co., Detroit. Operations of the latter company will continue under the Young Bros. name as will the sale, manufacture and installation of its ovens.

—o—

Tube Turns Inc., Louisville, has appointed Ardun Co., Tulsa, Okla., as distributor of fittings and flanges.

—o—

Westinghouse Electric Supply Co., subsidiary of Westinghouse Electric Corp., has moved to its new office building and warehouse at 209 W. General Robinson St., Northside, Pittsburgh.

—o—

Vacuum Cleaner Manufacturers' Association, Cleveland, reveals that factory sales of standard-size household vacuum cleaners in December totalled 274,180 units, an increase of 7.5 per cent over November sales, but 26.5 per cent below the figures for December, 1947.

—o—

Sperry Corp., New York, manufacturer of aviation and steamship instruments, as well as many other products, has acquired all the common stock of Wright's Automatic Machinery Co., Durham, N. C., maker of packaging machinery. Sperry had owned 50 per cent of the firm since 1945.

—o—

Diamond Alkali Co.'s coke sales office in Cleveland has been moved to 217 Union Commerce Building, where the company's general offices are located.

—o—

U. S. Steel Corp. and Mellon National Bank & Trust Co. plan to build a 40-story office building in downtown Pittsburgh. Space in the structure would be taken by Mellon Bank and U. S. Steel. City has approved the skyscraper which would be higher than the limit set by zoning regulations.

—o—

Electric Auto-Lite Co., Toledo, O., reports its new wire plant at Hazelton, Pa., will be in operation by May. It will produce wire and cable for automotive and industrial use to supplement output of the firm's present plant at Port Huron, Mich.

—o—

Bethlehem Steel Co. will boost the coke producing capacity of its Sparrows Point, Md., plant by 17 per cent through addition of 65 new coke ovens having a total capacity of 420,000 net tons of coke a year. Construction on the new battery, to be the ninth at the plant, will begin soon and will be completed in about 15 months.

—o—

Swartwout Co., Cleveland, is establishing a sales and service office for its power plant control division at 1817 E. Allegheny Ave., Philadelphia, Feb. 1. R. J. Jones and R. H. Frost are in charge. Swartwout's other division, the ventilator unit, will continue to have its Philadelphia sales and service office at 328 Chestnut St. W. F. Hawk remains in charge.

The Business Trend

CONTINUING its steady climb, industrial activity as measured by STEEL's index for the week ended Jan. 22 advanced 3 points to 174 per cent (preliminary) of the 1936-1939 average. The index for the latest week is 5 points higher than in the like week a year ago.

STEEL—For the second consecutive week, production of steel for ingots and castings set a new all-time weekly record. Operations during the week ended Jan. 22 were at 100 per cent of capacity, yielding an estimated 1,843,516 net tons compared with 1,830,600 tons in the preceding week.

AUTOMOBILES—Further gains in volume by the automobile builders also contributed to the advance by the industrial production index. The increase in assemblies for the week ended Jan. 22 over the preceding week amounted to less than 2000 units because some assembly lines turning out new models have not hit their stride. Peak outturn probably will not be achieved by the industry for some time, however, as additional model changeovers are still in progress.

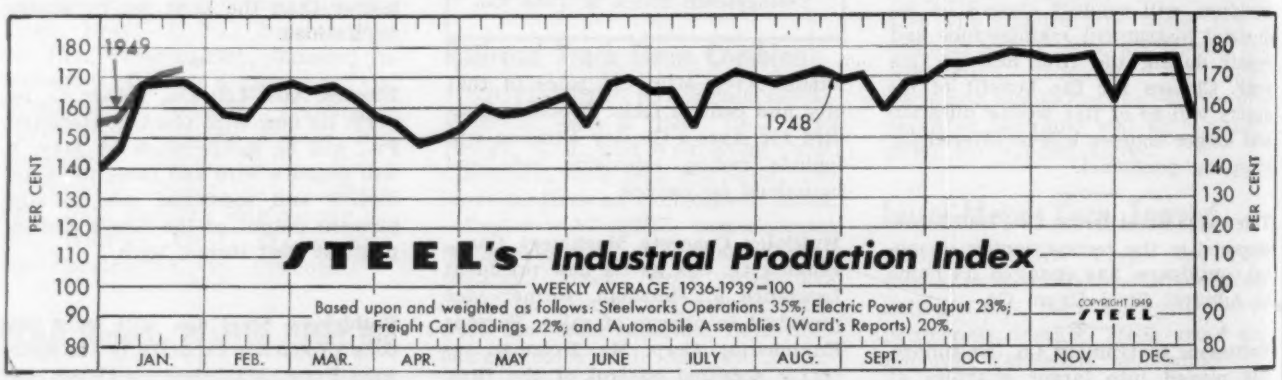
PETROLEUM—Prices of heavy fuel oils are being reduced because production is currently ahead of demand. Predictions made last fall about a shortage of fuel oil this winter have not been borne out, and instead the petroleum industry finds itself overstocked. Total crude stocks at the beginning of December were more than 250 million barrels, according to the Bureau of Mines. This figure represents a rise of more than 6 million barrels in stocks during November.

CONSTRUCTION—Civil engineering construction volume in the continental United States totaled $96.6 million in the week ended Jan. 20 and represented a decline of 27 per cent from the total for the previous week. The cumulative total for the first three weeks of 1949, however, is $353.7 million, 38 per cent above the cumulative total a year ago.

RAILROADS—Class 1 railroads and railroad-owned and controlled private refrigerator car companies placed 102,737 new freight cars in service in 1948, according to the Association of American Railroads. This was the largest number of freight cars installed in any year since 1925 when approximately 105,000 were put in service. During the past year the railroads retired 81,659 freight cars compared with 71,331 in 1947. They also put 1487 new locomotives in service of which 86 were steam, 4 electric and 1397 diesel.

COAL—Production of bituminous coal continues below levels of a year ago as demand is light and stockpiles continue to grow. During the week ended Jan. 15, production was 11,870,000 net tons, more than 1.2 million tons below same week last year.

PRICES—Bureau of Labor Statistics' average primary market prices declined 0.7 per cent in the week ended Jan. 18. The index is now 159.3 per cent of the 1926 average, 4.3 per cent below comparable week in 1948.



Index (chart above): Week ended Jan. 22 (preliminary) 174 Previous Week 171 Month Ago 155 Year Ago 169

BAROMETERS of BUSINESS

INDUSTRY	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)†	100.0	99.0	88.0	96.5
Electric Power Distributed (million kilowatt hours)	5,769	5,727	5,508	5,436
Bituminous Coal Production (daily av.—1000 tons)	1,978	1,914	1,866	2,180
Petroleum Production (daily av.—1000 bbl)	5,418	5,428	5,641	5,336
Construction Volume (ENR—Unit $1,000,000)	$96.6	$132.6	$173.2	$118.9
Automobile and Truck Output (Ward's—number units)	114,247	112,587	94,668	110,774

* Dates on request. † 1949 weekly capacity is 1,843,516 net tons. 1948 weekly capacity was 1,802,476 net tons.

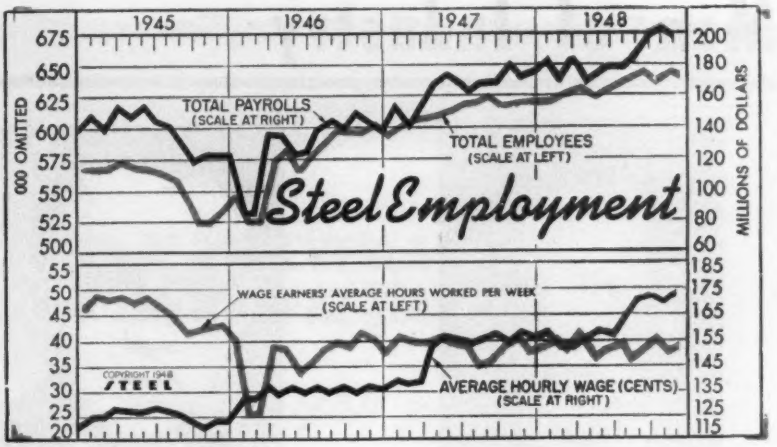
TRADE				
Freight Carloadings (unit—1000 cars)	750†	733	609	772
Business Failures (Dun & Bradstreet, number)	120†	127	116	109
Money in Circulation (in millions of dollars)‡	$27,763	$27,919	$28,560	$28,211
Department Store Sales (changes from like wk. a yr. ago)‡	+6%	+8%	none	+4%

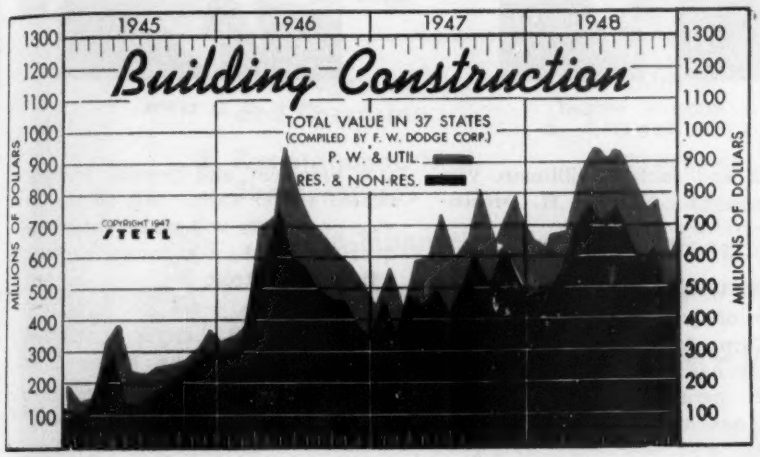
† Preliminary. ‡ Federal Reserve Board.

Steel Employment

	Employees† (000)		Total Payrolls (millions)		Hourly Wages† (cents)	
	1948	1947	1948	1947	1948	1947
Jan.	622	601	$180.2	$155.8	157.3	138.1
Feb.	626	607	167.6	139.5	155.1	137.0
Mar.	629	609	183.0	150.6	154.8	137.9
April	626	611	168.5	168.3	155.1	153.3
May	628	615	175.3	175.8	157.7	155.6
June	634	623	179.5	167.6	156.9	154.7
July	641	623	179.8	163.2	164.5	153.9
Aug.	645	625	193.8	169.1	168.9	155.6
Sept.	641	618	199.4	168.9	171.8	157.1
Oct.	644	620	201.7	180.1	169.9	154.6
Nov.	646	624	199.8	171.0	172.1	158.7
Dec.	...	621	....	175.3	....	156.5

† Monthly average.





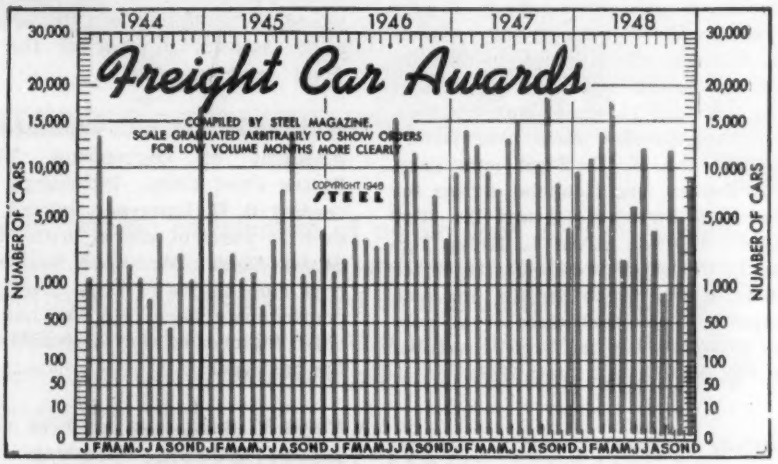
Construction Valuation in 37 States
(Unit—$1,000,000)

	Total	Public Works Utilities		Residential and Non-residential	
	1948	1948	1947	1948	1947
Jan.	615.2	136.6	113.9	478.6	457.7
Feb.	682.0	177.3	90.5	504.6	351.6
Mar.	689.8	164.3	122.0	525.5	474.8
Apr.	873.9	184.7	161.4	689.2	441.0
May	970.8	205.0	252.9	765.8	490.0
June	935.2	215.7	185.7	719.5	419.4
July	962.7	217.9	165.9	744.8	494.4
Aug.	854.1	207.8	223.5	646.3	599.7
Sept.	762.2	202.7	141.5	559.5	508.4
Oct.	778.6	165.5	165.9	613.1	627.4
Nov.	611.2	106.9	181.5	504.3	533.6
Dec.	694.0	170.9	154.1	523.1	471.3
Tot.	9,429.6	2,155.3	1,958.8	7,274.4	5,869.3

Freight Car Awards

	††1948	*1947	*1946	1945	1944
Jan.	8,613	9,222	1,481	7,200	1,020
Feb.	10,698	13,724	2,328	1,750	13,240
Mar.	13,227	12,048	4,512	2,500	6,510
Apr.	17,215	9,186	3,564	1,120	4,519
May	2,228	7,389	2,900	1,526	1,952
June	5,368	12,784	3,335	670	1,156
July	11,308	14,840	14,836	3,500	795
Aug.	3,638	2,352	9,527	7,240	3,900
Sept.	738	9,917	11,102	12,840	400
Oct.	10,931	17,737	3,407	1,320	2,425
Nov.	4,852	8,079	7,190	1,650	1,065
Dec.	8,368	4,030	3,011	4,116	16,245
Total	97,184	121,308	67,193	45,432	53,221

*American Railway Car Institute.
†Preliminary.


1944
1945
1946
1947
1948
Freight Car Awards
COMPILED BY STEEL MAGAZINE.
SCALE GRADUATED ARBITRARILY TO SHOW ORDERS FOR LOW VOLUME MONTHS MORE CLEARLY
COPYRIGHT 1948 STEEL
NUMBER OF CARS
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D

FINANCE

	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	$13,730	$13,085	$15,998	$14,158
Federal Gross Debt (billions)	$252.3	$252.3	$252.4	$256.6
Bond Volume, NYSE (millions)	$19.5	$14.5	$16.3	$23.8
Stocks Sales, NYSE (thousands)	4,107	4,085	5,033	5,144
Loans and Investments (billions)†	$62.6	$62.6	$62.9	$65.1
United States Gov't. Obligations Held (millions)†	$33,324	$33,484	$33,440	$37,587

† Member banks, Federal Reserve System.

PRICES

STEEL's Composite Finished Steel Price Average	$97.77	$97.77	$95.50	$78.41
STEEL's Nonferrous Metal Composite‡	232.6	232.6	232.6	188.3
All Commodities†	159.3	160.5	162.5	166.5
Metals and Metal Products†	175.3	175.3	173.7	154.2

† Bureau of Labor Statistics Index, 1926=100. ‡ 1936-1939=100.

Men of Industry

WILLIAM I. ONG

HUGH W. WRIGHT

O. O. LEWIS

William I. Ong has been appointed assistant to the president, American Steel & Wire Co., Cleveland. Mr. Ong has been director of the company's public relations department since its organization in 1937, and of the Ohio-Michigan district public relations of other United States Steel Corp. subsidiaries. Before joining American Steel & Wire, he was associated with Dow-Jones & Co., publishers of the *Wall Street Journal*, as Cleveland manager. **Lewis E. Zender** succeeds Mr. Ong as director of public relations. He has been a member of the public relations department for the past 11 years and has been assistant director since 1944. Before joining the U. S. Steel subsidiary, Mr. Zender was financial writer for the *Wall Street News* and the *Wall Street Journal*. **Alvin L. Kreig,** formerly Cleveland bureau manager for International News Service, has been appointed assistant director of public relations. He has been a member of the department since 1946.

—o—

Harvey C. Hopkins, general manager of purchases since 1944 for American Can Co., New York, has been named vice president in charge of purchasing and traffic, succeeding the late **Albert R. Pfeltz. A. C. Staley Jr.,** who has been the company sales manager for metropolitan New York, has been named assistant general manager of sales. In his new post Mr. Staley will assist in the direct supervision of the company's sales activities in the United States and Canada.

—o—

James G. Devin has been elected president, Marsh Valve Co., Dunkirk, N. Y. Others officers are: **David D. Nash** and **Jack R. Silliman,** vice presidents, and **Norman H. Drosendahl,** secretary-treasurer.

—o—

Hugh W. Wright has been appointed director of public relations, Armco Steel Corp., Middletown, O., and **R. G. Adair** has been appointed director of personal relations. Mr. Wright, associated with Armco since 1916, has been supervisor of public relations since 1936. Mr. Adair also joined the company in 1916, and has been assistant director of the personal relations staff.

—o—

M. W. Reed has been appointed vice president of engineering, United States Steel Corp., Pittsburgh, succeeding **B. H. Lawrence,** retired after over 44 years of service with United States Steel. Mr. Reed has served with subsidiaries of U. S. Steel Corp. continuously since 1916, and has been chief engineer of that corporation for the past year.

—o—

Floyd V. Snodgrass has been named general manager, Nordstrom Valve Division's Oakland, Calif., plant, Rockwell Mfg. Co., Pittsburgh.

—o—

Four new vice presidencies representing major departmental operations have been created by Federal-Mogul Corp., Detroit. **M. A. Hunter** is in charge of manufacturing. He also serves on the board of directors. **Ernest R. Darby,** who is in charge of research, is director of the corporation's research laboratory at Ann Arbor, Mich. **Rogers I. Marquis** is in charge of industrial relations. **Neil A. Moore,** who is in charge of the Service Division, joined the company recently, having previously been vice president and general manager, Sealed Power Corp. All of the new vice presidents will make their headquarters at the company's executive offices in Detroit.

—o—

Promotions and changes in the Sales Division of Fairbanks, Morse & Co., Chicago, have been announced as follows: **O. O. Lewis,** until a short time ago assistant sales manager, has been promoted to sales manager; **Harry L. Hilleary,** manager of the St. Louis branch, has been transferred to the company's headquarters office in Chicago, and promoted to assistant sales manager; **L. A. Weom,** manager, Pump Division, has become branch house manager, St. Louis, succeeding Mr. Hilleary; and **Donald T. Johnstone,** assistant manager, Pump Division, succeeds Mr. Weom as manager of the corporation's Pump Division, Chicago.

—o—

James J. Nelson, formerly sales representative, has been appointed eastern sales manager, National Bearing Division, American Brake Shoe Co., New York. He previously served as a divisional vice president of the Baldwin Locomotive Works.

—o—

Announcement has been made by Cutler-Hammer Inc., Milwaukee, of the appointment of **W. C. Lyon** to head the company's patent department, succeeding **F. H. Hubbard.** Mr. Hubbard has been with Cutler-Hammer since 1907, and will now continue to serve in an advisory capacity.

—o—

William R. Moore has been elected a director, Norton Co., Worcester, Mass. He is currently a vice presi-

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dent of the company, in charge of national accounts and the sale of refractories, abrasive grain and ore, pulpstones, Norbide products and non-slip floors.

—o—

Thomas Shea, former district manager, New York, has been named general sales manager of Le Roi Co., Milwaukee. **E. F. H. Dutton,** who has been in the Export Division, stationed in Buenos Aires, Argentina, has been named to succeed Mr. Shea at New York. **Norman Sedgwick,** former central district manager, Milwaukee, was made manager of distributor sales, also with headquarters at Milwaukee.

—o—

R. Lindley Murray, vice president in charge of development and research, Hooker Electrochemical Co., Niagara Falls, N. Y., has been promoted to the newly created position of executive vice president. **Harry M. Hooker** has resigned as chairman of the board but will continue as a director. **Roger W. Hooker,** vice president and sales manager, was named vice president in charge of sales; **Jesse H. Babcock,** manager of development and research, was designated director of development and research; and **Robert E. Wilkin,** eastern sales manager, was promoted to general sales manager.

—o—

John V. Boardman, formerly assistant general manager, Worth Steel Co., Claymont, Del., has been appointed general superintendent. Before joining Worth Steel in 1946 he was connected with the rolling mills department, Jones & Laughlin Steel Corp., Pittsburgh Works.

—o—

George Martin and **Allen P. Wherry** have joined Pemco Corp., Baltimore. Mr. Martin will work out of the company's home office service department, and Mr. Wherry has been appointed service engineer in the southern territory of the company. Another new member of the corporation is **George G. Updike,** formerly associated with Porcelain Products Corp., Carey, O., who has been assigned to the company's control laboratory.

—o—

Gilbert J. Langenderfer has been assigned as district industrial engineer in the Indiana territory to represent Surface Combustion Corp., Toledo, O. He succeeds **Harry O. Bennett,** resigned. Mr. Langenderfer has spent eight years as an industrial engineer in the Chicago office for the sale and service of heat treating and other industrial furnace equipment, and until permanent Indiana office arrangements are made, he will operate out of the Chicago office of the company.

—o—

F. W. Chambers, who returned recently after a year and a half in Chile, working on a steel mill project for which Koppers Co. Inc., Pittsburgh, is consultant, has been named manager of production for Koppers Engineering & Construction Division. **O. H. Chambers** has been appointed assistant manager of production, and **A. B. Fisher Jr.,** a production engineer, has been appointed chief engineer of the division. Mr. Fisher succeeds **Ragnar Berg,** who will become consulting engineer, with duties largely in connection with the division's expanding foreign activities.

—o—

E. K. Miller, formerly assistant to the vice president of operations, has been appointed assistant vice president of operations, Jones & Laughlin Steel Corp., Pittsburgh. Mr. Miller joined the corporation's Aliquippa Works in 1929 as superintendent of steel works, and later was promoted to the positions of assistant general superintendent and general superintendent of the Aliquippa Works. **R. M. Hussey,** formerly superintendent, rod and wire department, Aliquippa Works, was appointed assistant manager of construction. **N. A. Hansen,** formerly assistant superintendent, rod and wire department of the works, has been appointed superintendent of that department succeeding Mr. Hussey. **F. D. Wilkins,** formerly general foreman, rod and wire department of the works, has been appointed assistant superintendent of the department, succeeding Mr. Hansen. **F. A. Campbell,** formerly liaison engineer on the chief engineer's staff, was appointed superintendent of field construction. **H. H. Morgan,** formerly roll designer, has been appointed assistant roll engineer.

—o—

Inland Steel Co., Chicago, announces appointment of **Derrick L. Brewster** as an additional assistant district sales manager of the company's Chicago district sales office. **Kenneth J. Burns** is district sales manager of the Chicago office, and **Otto G. Neumann** is also an assistant district sales manager.

—o—

A. E. Van Cleve has been appointed a vice president, Crucible Steel Co. of America, New York, in charge of specialty sales. Formerly plant manager of the Atha Works, Harrison, N. J., Mr. Van Cleve has been with Crucible throughout his business career.

—o—

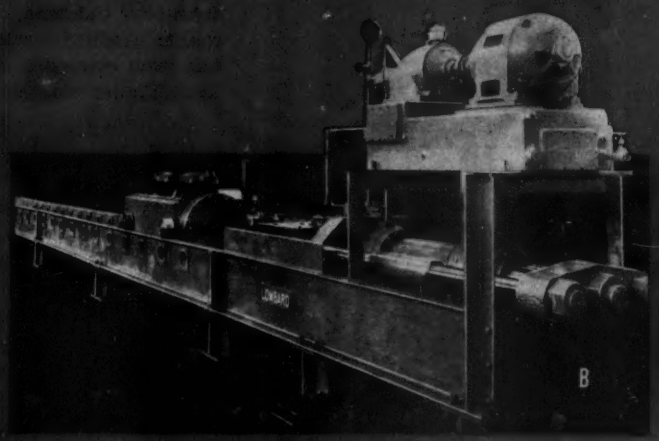
Warren W. Matlack has been named industrial manager of the New York City branch of Brown Instruments Division, Minneapolis-Honeywell Regulator Co., succeeding **O. B. Wilson,** now regional sales manager for the

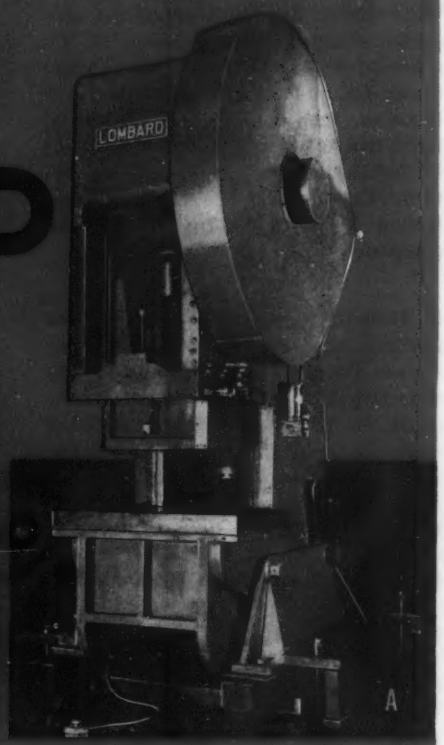
JOHN V. BOARDMAN

E. K. MILLER

A. E. VAN CLEVE

LOMBARD





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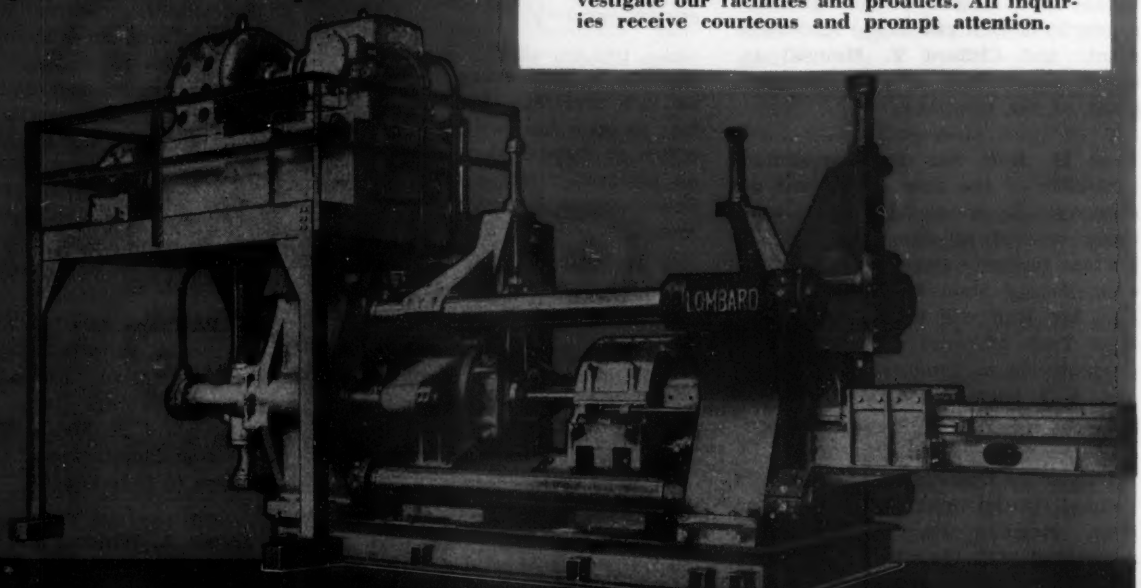

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east, central and southeast. **Devon W. Fryback** has been appointed district manager of the Albany, N. Y., office of Minneapolis-Honeywell Regulator Co. and its Brown Instruments Division, succeeding Mr. Matlack. **D. Lyle Russell** succeeds Mr. Fryback as industrial manager of the Hartford, Conn., district office of the Brown Instruments Division of the company.

—o—

C. Hubert Lenhart has resigned his position as general superintendent of Kaiser Co. Inc., Fontana, Calif., to associate himself as a vice president of H. A. Brassert & Co., consulting engineer for the iron and steel industry, New York.

—o—

Frank H. Stohr has been named general manager, Norwood Works, Allis-Chalmers Mfg. Co., Milwaukee.

—o—

Lloyd F. Hillring has been appointed export engineer, Studebaker Corp., South Bend, Ind., succeeding **Thomas L. Cowles,** under whom he served as assistant, and who has retired after 20 years with the corporation.

—o—

James H. Cooper has been appointed vice president in charge of engineering for McCord Corp., Detroit. He joined the company in 1910 and has served since 1935 as works manager.

—o—

Pittsburgh Steel Co., Pittsburgh, announces appointment of **Charles H. Williams Jr.** as superintendent of wire mills; **Donald J. Shaughnessy** as works accountant of the Monessen plant; and **Clifford T. Moluski** as works accountant of the Allenport plant of the company.

—o—

Fred H. Ruff has been appointed controller of the new steel plant of Compania de Acero del Pacifico now being erected at Concepcion, Chile. He was formerly secretary and treasurer, Jessop Steel Co., Washington, Pa. Mr. Ruff will be located at the New York office of Corporacion de Fomento de la Produccion of Chile, and will leave the United States early in the spring.

—o—

Matthew J. Donachie has been appointed works manager, Beryllium Corp., Reading, Pa. He has been associated with the company in consulting capacities since 1935.

—o—

McKinsey & Co., New York management consultant, announces appointment of **David E. Killam Jr.** to the New York staff as a consultant in the manufacturing field. He previously was associated with Thompson

E. L. O'MEARA JR.

Products Inc., Cleveland, and Westinghouse Electric Corp., at Pittsburgh and Sharon, Pa.

—o—

Harbison-Walker Refractories Co., Pittsburgh, announces promotion of **E. L. O'Meara Jr.** as assistant chief engineer. Associated with the company for more than 20 years, Mr. O'Meara served with both the Construction and Sales Divisions of the Engineering Department, and has been chief draftsman of the Construction Division since 1935.

—o—

Howard L. Franks has been appointed director of sales, Merrill Bros., Maspeth, N. Y. He recently served as sales manager, Charles Fischer Spring Co., and previously was with Carpenter Steel Co. in a sales executive capacity.

—o—

Harold J. Ruttenberg has resigned as vice president, Portsmouth Steel Co., to open his own steel brokerage office at Pittsburgh. He had served as research director of CIO United Steelworkers before joining Portsmouth.

—o—

National Supply Co., Pittsburgh, announces appointment of **Ernest G. Unrath** as general superintendent at the Ambridge, Pa., plant of its Spang-Chalfant Division, succeeding the late **H. J. Litsey.**

—o—

Arthur H. Kitson has been appointed vice president and eastern regional sales manager, Independent Farm Industries, national sales organization for independent manufacturers of farm equipment, Chicago.

—o—

Dr. Frank B. Jewett, formerly chairman of the board, Bell Telephone Laboratories, and formerly president, National Academy of Sciences, has accepted appointment as a member of the board of trustees of Battelle Memorial Institute, Columbus, O. He will fill a vacancy created by the death of **Dr. Rolland C. Allen,** Cleveland industrialist.

—o—

T. Kennedy Stevenson has retired as vice president and director, Western Electric Co., to join Griscom-Russel Co., New York, as chairman of its executive committee.

—o—

John S. Coleman, president, Burroughs Adding Machine Co., Detroit, has been elected a director of Fruehauf Trailer Co., Detroit.

—o—

Otis T. Hamby has been appointed general works manager of the new Nine-Mile press plant, Dodge Division, Chrysler Corp., Detroit.

—o—

L. S. MacKay has been appointed director of purchases for Kaiser-Frazer Corp., Ypsilanti, Mich., succeeding **Fred Lord,** resigned.

—o—

Frank B. Stewart has been appointed district manager of the San Francisco warehouse, U. S. Steel Supply Co., and **Paul C. Van Cleave** was named district manager of the Los Angeles warehouse.

—o—

A. A. Gustafson has been appointed representative in Minnesota and Iowa territories for Palnut Co., Irvington, N. J.

—o—

Baldwin Locomotive Works, Philadelphia, announces appointment of **D. R. Staples** as manager, diesel locomotive engineering department, and **Ralph A. Miller,** section manager of the electrical section. **Clyde Moyer** has been appointed Philadelphia district representative of the testing equipment department, succeeding **Roger Schofield,** transferred to the company's transportation field.

—o—

H. W. Clapsaddle has been appointed divisional comptroller of Buick-Oldsmobile-Pontiac Assembly Division, General Motors Corp., Detroit. He succeeds **J. A. McFetridge,** appointed division comptroller of the Allison Division in Indianapolis.

—o—

James A. Whiting has been appointed assistant superintendent, Hubbard blast furnace of Youngstown Sheet & Tube Co., Youngstown, O. He succeeds the late **James Hays.**

—o—

Dr. John W. Coltman has been appointed manager, electronics and nuclear physics department, research laboratories, Westinghouse Electric

Corp., Pittsburgh, succeeding **Dr. William E. Shoupp,** recently named director of research of the company's Atomic Power Division. **V. B. Baker** was appointed manager of the general mill section, industry engineering department of the company's East Pittsburgh Works, succeeding **J. C. Fink,** recently made manager, industry engineering department. **C. J. Burnside,** associated with Westinghouse radio and electronic activities for 24 years, has resigned and has organized an independent industrial consultant service, with headquarters in Baltimore. Mr. Burnside will continue his association with Westinghouse as a consultant.

—o—

James L. Mayer has been appointed director of industrial relations, Douglas Aircraft Co. Inc., Santa Monica, Calif., succeeding **Fred C. Fischer,** resigned.

—o—

John C. Wilson has been elected a director and vice president in charge of sales, Thompson Grinder Co., Springfield, O. Mr. Wilson will continue to supervise advertising. He had 20 years of experience in the field of grinding wheels and grinding machines, and for the past 10 years has been designer, chief draftsman, chief engineer and sales manager with Thompson Grinder Co.

—o—

R. L. deBrauwere has been elected assistant vice president, Scovill Mfg. Co., Waterbury, Conn. He will continue as assistant secretary of the company and as secretary and director, A. Schrader's Son Inc., Brooklyn, N. Y., division of the company. He joined Schrader's in 1915.

J. SETON GRAY

Formerly president, Fuller Mfg. Co., Kalamazoo, Mich., elected chairman of the board. Noted in STEEL, Jan. 24 issue, p. 46

—o—

James R. Derrick has been appointed assistant sales manager, Pennsylvania Flexible Metallic Tubing Co., Philadelphia.

—o—

C. A. Scharschu, director of research, Allegheny Ludlum Steel Corp., Pittsburgh, has been appointed assistant technical director. **Dr. L. C. Hicks,** associate director of research, will succeed Mr. Scharschu as director of research.

—o—

W. R. Cunnick has been appointed vice president and general manager of sales, Great Lakes Steel Corp., Detroit. Recently assistant vice president and assistant general manager in charge of sales, Weirton Steel Co., Weirton, W. Va., sister company of Great Lakes Steel, he will make his headquarters at Ecorse, Mich.

—o—

William E. Brewster, manager of operations, Steel Division, International Harvester Co., Chicago, has retired from active service.

—o—

Food Machinery & Chemical Co. has opened a new district office for its Peerless Pump Division at Omaha, Nebr., with **J. W. L. Stone** as district manager.

—o—

N. E. Wahlstrom, general superintendent of southern plants, Southern States Iron Roofing Co., Savannah, Ga., has been appointed to the executive committee of the company.

—o—

M. H. Freedman has been appointed Pacific Northwest Division manager, Columbia Steel Co. **C. C. Johns** also was named manager of sales, Portland, Oreg., and **Ralph Winship** will be manager of sales at Seattle, succeeding Mr. Freedman, whose headquarters will now be at San Francisco.

—o—

Roy Case has been appointed superintendent, butt and continuous tube mills, Republic Steel Corp., at Youngstown. He succeeds **Charles Fette,** retired.

—o—

D. D. Roberts has been elected manager of the Pacific Coast branch, National Lead Co., and **C. H. Sondhaus** was appointed assistant manager.

OBITUARIES . . .

Edward E. Klooz, 80, for many years head of the Portage Silica Co. and its successor, Silica Corp., Youngstown, died Jan. 22 at his home in Youngstown. A graduate of Case Institute of Technology in 1891, Mr. Klooz spent a year in the iron mining region of northern Michigan. Later he served as a chemist for the Grasselli Chemical Co., and in 1898 became manager of the cement department of the Brier Hill Iron & Coal Co., Youngstown. From 1909 to 1929 he was with the Portage Silica Co. and its successor, and since 1942 he was president of the Mahoning Valley Mortgage Co., Youngstown.

—o—

Ernest H. Foster, 83, a director, Foster Wheeler Corp., New York, died Jan. 23 in Daytona Beach, Fla. He and his cousin, the late Pell W. Foster, developed the Foster steam superheater after they founded, in 1900, the Power Specialty Co., machinery manufacturer, which later became the Foster Wheeler Corp.

—o—

Dr. George J. Mead, 58, aircraft engine designer, and co-founder of Pratt & Whitney Aircraft, now the engine-building division of United Aircraft Corp., Hartford, Conn., died Jan. 20 after a long illness. He was vice president of United Aircraft Corp. when he resigned in 1939 because of illness.

—o—

John T. Nelson, 83, partner in H. M. Nelson Machine & Iron Works Corp., Newark, N. J., until his retirement five years ago, died Jan. 20.

—o—

Charles E. LeNeve Arnold, 65, consulting engineer with Anaconda Copper Mining Co., New York, died Jan. 24 at his home in East Orange, N. J.

—o—

Seeley F. Pratt, 55, president, Union Steel Chest Corp., Le Roy, N. Y., died recently.

—o—

Walter T. Gillespie, 62, chief engineer, Standard Stoker Co., died Jan. 16 after an extended illness.

—o—

Frank C. Jones, 61, president and general manager, Okonite Co., Passaic, N. J., died Jan. 20. He also was president, Okonite-Calender Cable Co. Inc., Paterson, N. J.

—o—

George W. Emrick, 64, chairman of the board and former president, Ettco Tool Co., Brooklyn, N. Y., died Jan. 19 in Palm Beach, Fla.

—o—

Charles Knupfer, 71, former senior vice president, Carborundum Co., Niagara Falls, N. Y., died Jan. 11.

—o—

Harry L. Ferguson, 67, president, Acme Aluminum Foundry Co., Chicago, died recently of a heart attack.

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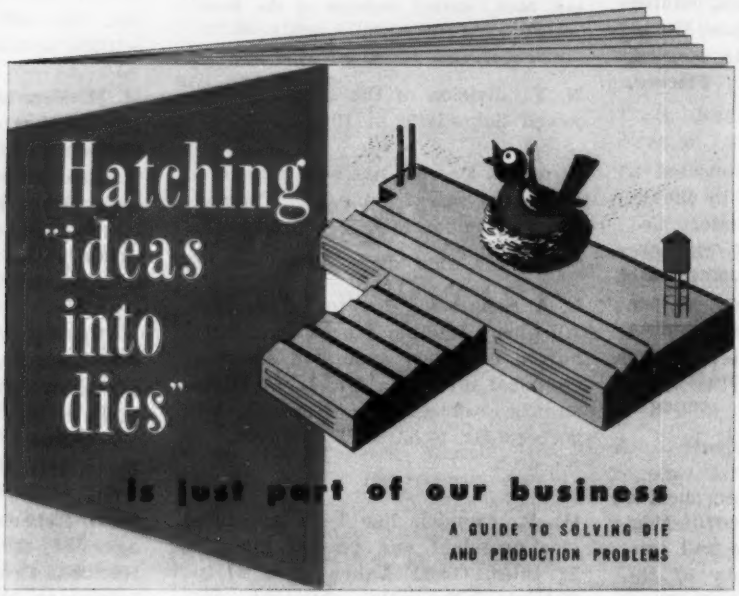
a Die story for "die hards"



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Engineering News
. . . AT A GLANCE

TESTS STEEL STRIP FOR TELEVISION—In Youngstown, it was learned, high-grade thin strip steel produced by Cold Metal Products Co. is aiding the television industry to solve more of its problems. The strip is being furnished to RCA to be used experimentally for combining glass in a new type television viewing tube expected to give superior performance. Some of the strip already is being used by the television industry as one of the metal coats of the coaxial cable employed to carry television network programs.

SPEEDS UP FUEL TESTING—To speed up improvements to benefit the consumer more quickly, engineers of The Texas Co. are making laboratory use of single-cylinder Lauson engines in screening fuels and lubricants. Results closely comparable to full scale test runs are provided by the units, yet fuel requirements for the work are cut from 200 to 15 gallons and oil requirements from 3 gallons to 3 quarts. Engines are used to test additives in varying concentrations, the effects of oils on engine cleanliness, bearing lubrication and performance.

WORK AND OUTPUT RAISER—Latest welding line incorporated in A. O. Smith Corp.'s plant in Milwaukee is designed to accommodate requirements for 60 per cent more welding in the '49 Chrysler auto frames currently being processed. The new line is 400 feet long, most of it occupied by two platforms which are raised about 5 feet above the conventional line. Speeded-up welding activity is attributed to these platforms. Each includes four openings at each of which six men work. First platform handles four frames in upright position. Coming down the line they halt under the first platform and are raised simultaneously to welding level. When the upright work is completed, the frames are dropped back to the conveyor level, turned over automatically and then carried to the second platform where the process is repeated.

ELECTRONIC "SLIDE RULE"—By simply "writing" with electrical circuits, an engineer can solve as many as 20 separate mathematical equations when using an electronic device developed recently by Goodyear Aircraft Corp. for the Air Force. Using a switchboard similar to a telephone board, the operator merely plugs in any desired equation by "hooking up" a variety of circuit combinations. Once the machine is set for a particular equation, it will give the answers in a speedy stream on a special tape in the same length of time required for the motion to take place. Two such "brains" can be wired together to solve more complicated problems.

VERSATILE TURBINE—In Schenectady, N. Y., General Electric Co.'s gas turbine power plant development program is being extended to include a 5000 kilowatt stationary unit designed for continuous operation at 1500° F turbine inlet temperature. Unit is expected to produce a kilowatt hour at the generator terminals of 12,900 Btu at rated conditions based on the higher heating value of bunker C fuel oil. With minor changes, the company reports, it should be able to burn practically any liquid or gaseous hydrocarbon fuel. Turbine construction is such that no major redesign should be required to permit the use of coal when coal combustion for gas turbines is sufficiently developed. Factory tests on the turbine are expected to be made early this year.

DOVETAILING FACTORS — Before a coolant system can be used effectively in grinding operations involving hardened steel, prime consideration should be accorded both the grinding wheel and spindle. Surface grinding wheels and spindles, it is pointed out, do not all react alike. While a certain type spindle will resist a substantial increase in depth of cut, longitudinal and cross feed over that used for a finishing cut, with no apparent decrease in speed, others suffer a loss of 500 to 1000 revolutions per minute with any sudden abnormal increase in depth of cut and feeds. (p. 56)

GOOD ROUTINE METHOD — Although usual method of determining carbon in low-carbon steel still continues to give good results, experiments with a so-called low-pressure method is reported to be a precise means for such determinations—even for use on a routine basis. Work conducted by H. H. Uhlig of MIT and J. J. Naughton of the University of Hawaii, also shows that the method is a precise technique in determining carbon in high carbon steels. (p. 60)

"SWITCHED" POWER—Most of the high-frequency generators utilized in the new Louisville tractor plant of International Harvester Co. are strategically located overhead above the induction heating department. This arrangement not only keeps the generating equipment separated from the heating stations, but also helps provide more flexibility in operating the the induction stations. (p. 62)

"CAPPED" INGOTS—When teeming a heat of rimming steel, tops of the molten ingots boil very actively with the evolution of much gas and many sparks. The ingot immediately starts to "freeze" from the edges of the mold toward the center. To stop further evolution of gas which would create a very uneven or "bull head" top, the ingot is "covered" with a heavy cast iron cap weighing up to 1000 pounds. This is placed on the ingot when a square of open metal of about 6 x 6 inches remains during the freezing action. The cap is not removed until the top is completely solidified. (p. 82)

"COOL" GRINDING

Surface Hardened Steel

By a system which permits coolant to flow through pores of the grinding wheel, heat generated by the grinding action is substantially reduced and surface cracks thereby eliminated

By H. J. CHAMBERLAND

UNTIL the introduction of foolproof means some years ago of detecting cracks in hardened steel, previous to a part being subjected to a grinding operation, discovery of such defects thereafter always brought out serious discussions as to whether the responsibility rested with the hardener or with the grinder. Depending on operating conditions, it is likely that such controversies are still prevailing; regardless of the source of trouble the cost is at least twice that of a decade ago.

The fact remains that with absolute control over all stages of heat treating, as of today, and scientific methods of inspection in connection thereto, the subject of cracks in hardened steel reverts particularly to the grinding operation. With the full realization that in dry surface grinding excessive heat can be avoided only by minimizing depth of cut and rate of

Fig. 1 — Top: Pattern of surface cracks in high-carbon, high-chromium steel developed from abnormal depth of cut and inefficient conventional cooling conditions. Bottom: Opposite side of the same piece of steel, showing surface as ground with only a "mist" as a cooling agent while subjected to the same depth of cut

Fig. 2 — Typical example of a production surface grinding operation requiring close precision and good visibility of work surface

traverse and transverse feed. Because this brings the labor cost element into the picture, this article will deal briefly with the factors governing an efficient conventional cooling system and the advantages of a most recent development along these lines known as "cool grinding."

Functions of Coolant—First, we are concerned with the functions of the coolant as a preventive against wheel cracks rather than its effectiveness in improving finish and dimensional accuracy. In this latter connection there are numerous constructive factors which are inseperable from and responsible to the coolant system. Assuming that the grinding machine itself is as modern as the heat treating techniques in force, two factors directly related to the coolant cannot be ignored: Grinding wheel and spindle which must function as an integral unit.

Surface grinding wheels and spindles do not all react alike. If one believes his wheel selection is best for grinding hardened steel, he shouldn't be surprised to hear of another wheel capable of cutting twice as fast and deep while delivering as fine a finish with 50 per cent less heat being generated. This applies likewise to the spindle because it is a well known fact that so-called ball bearing spindles vary radically in design. While a certain type will resist a substantial increase in depth of cut, longitudinal and cross feed over that used for a finishing cut, with no apparent decrease in speed, others suffer a loss of from 500 to 1000 revolutions per minute with any sudden abnormal increase in depth of cut and feeds. Selecting the most efficient surface grinding wheel for hardened steel and a spindle in support of its predetermined cutting qualities, are indeed of prime consideration before the coolant system used can really be effective in preventing injury to the work surface.

Cooling Systems — In industry, dust always has been of vital concern to production, maintenance and personnel, so while a properly functioning cooling system speeds production and eliminates costly risks of work spoilage, it therefore proves simultaneously economical in many other ways.

Conventional or recirculating cooling systems of grinding and other machine tools comprise principally the tank and fluid or compound. It is assumed that tanks used in connection with all modern equipment are designed for all foreign matter to settle readily, properly and thereby prevent its recirculating through the system. Since the prime purpose of the coolant is to dissipate heat most readily, flow must be not only adequate but uniform if an equable temperature is to be maintained because results of sudden changes in temperature are obvious.

High Temperatures Met—Unless one is most familiar with the exact process of the abrading action of wheel and work contact, the high temperatures possible may not be appreciated. Color of sparks thrown off at point of contact, when dry grinding, often indicate temperatures of 2200° F for the harder steels and up to 1500° F for the milder steels. Unless these terrific temperatures are readily and efficiently absorbed or controlled by the coolant, results will be distortion, false increase in measurements or wheel cracks if the piece is hardened steel.

Most decisive with the performance of the conventional cooling system is its quality. Oil used in its compounding requires unusual properties which are as essential in the prevention of surface injury as to improvement and maintenance of various forms of precision allied to many surface grinding operations. In this respect, a specially processed soluble oil industrially known as 470 is said to provide all requisites for a most effective coolant.

As the direct results of a unique method of homogenizing, whereby artificial or colloidal graphite becomes perfectly and permanently suspended in a high grade carrier oil, the grinding compound derived therefrom incorporates the following features:

The oil readily emulsifies with water in any of the standard proportions when used as an economical substitute for cutting oils, with grinding coolants requiring the minimum of one part of oil to 80 parts of water. The emulsion has excellent wetting action and is quite free from foaming; such properties are imperative for the rapid removal of heat or its uniform distribution throughout the piece being ground.

Emulsion has reasonably low surface tension, meaning that all particles of abrasive and metal entrained in the coolant are readily precipitated in the

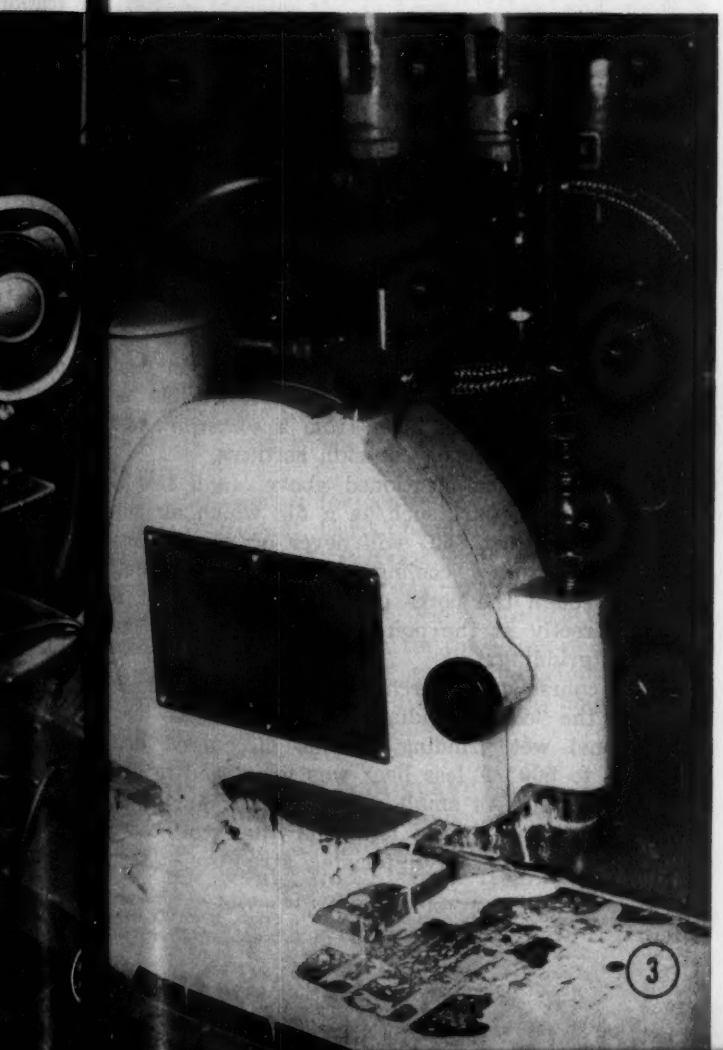


Fig. 3 — Surface grinding setup arranged for a series of tests to determine comparative efficiency of conventional and improved cooling systems on various types of hardened alloy steels

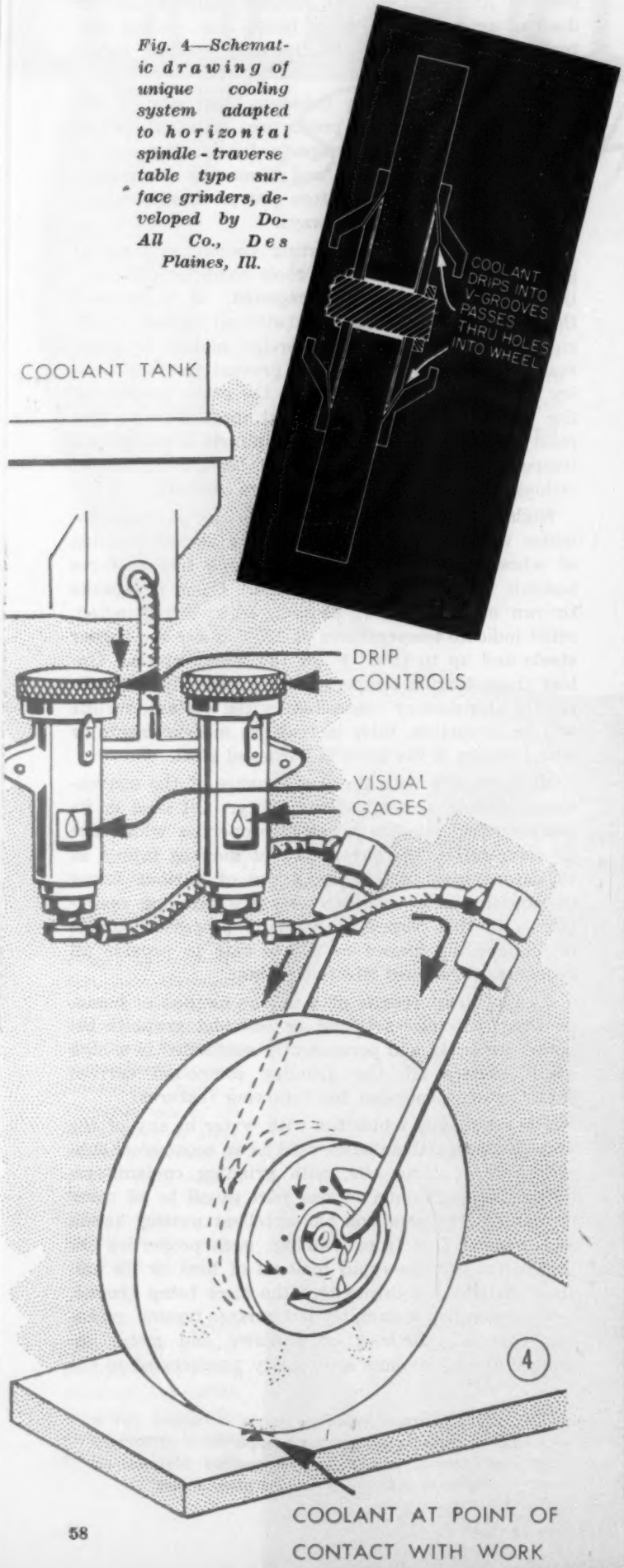


Fig. 4—Schematic drawing of unique cooling system adapted to horizontal spindle-traverse table type surface grinders, developed by Do-All Co., Des Plaines, Ill.

bottom of the pump tank. This is highly important when surface grinding hardened steel.

"Cool Grinding"—This method of heat control in the course of surface grinding hardened steel, although a recent innovation, has already demonstrated its efficiency. The new cooling process is indeed a wide step forward in surface grinding technique, even if the substituting of several gallons of coolant per mintue on the work with a fine mist constituted its only advantage over the conventional system. In short, it turns the dry grinding machine into wet grinding at will with continuous visibility of work and cleanliness. The system results in constant flushing action.

It will be observed in the accompanying schematic drawing that the system, or attachment, consists basically of a reservoir holding 1 gallon of a special coolant and enough for 8 hours' operation, two sight drip valves to regulate the flow of coolant and a special wheel adapter which introduces the coolant into the arbor hole of the grinding wheel.

Gravity Flow—In operation, the coolant flows by gravity through the flexible tubes into the V groove collector ring that is part of the nut that holds the wheel. The coolant then passes through holes into the grinding wheel. These holes are so located that the coolant enters the wheel outside the lead bushing whence it is flung by centrifugal force to the outside edge where it cools the work at point of contact. To provide means of getting the coolant to both sides of the wheel, the body of the grinding wheel adapter has a V-groove and holes on the back of the flange. Since the coolant enters this groove from separate tubes, both edges of the grinding wheel face are cooled.

As previously stated, the primary purpose of the coolant is to keep the heat raised by the grinding action as low as possible and to dissipate any amount of heat generated. Conventionally, the coolant arrives at the work just behind the cut. In other words, there is no coolant where it definitely should be or at the very point where the grinding is actually done. Evidently, what happens is a sudden rise in temperature in the work and there follows a sudden shock quench. It is this sudden rise in temperature and shock quench that is responsible for surface cracks; looking at it from a somewhat less disastrous angle, warpage or skin softness.

Costly results, as mentioned above, (and this is indeed true of a part such as a die which already might cost at least $50) will never or very seldom occur with the new cooling system. The coolant, coming through the pores of the grinding wheel, is applied directly at the point of contact and at the instant of grinding.

In the course of research to determine how much less heat the "cool" grinding process generated than conventional wet grinding, it was discovered that from 200 to 500° F less heat was generated by the unique process. As small as this might appear to be, it takes considerably less heat than the above minimum to considerably alter steel structure.

For more information on what can happen to ground surfaces, see Leo P. Tarasov's "Injury in Ground Surfaces", STEEL, Mar. 22, 1948, p. 71.

Seen and Heard in the Machinery Field

By GUY HUBBARD
Machine Tool Editor

POTTER & JOHNSTON'S FIFTIETH: I have just received a letter from E. C. Shultz, advertising manager, Pratt & Whitney, in which he says: "You may not be aware that our wholly owned subsidiary, Potter & Johnston Co., Pawtucket, R. I., celebrated its 50th anniversary on December 28, 1948."

As a matter of fact, I was aware of this anniversary—though not of its exact date—having studied into the origins of this company when I wrote "Development of Machine Tools in New England", some 25 years ago. Furthermore I almost have a right to say "I'm an old Potter & Johnston man myself".

When I went to work full time for the Windsor Machine Co., Windsor, Vermont, (Gridley automatics) in June of 1915, that machine tool organization had the same relationship to Potter & Johnston that Potter & Johnston has to Pratt & Whitney now. Hence my keen personal interest in this anniversary and in the commemorating book "50 Years of Achievement" presented to me by Ed Shultz.

James C. Potter (1855-1925) and John Johnston (1860-1942) were born, educated and learned the machinery business in Scotland, but America to them was the land of opportunity. They made good use of their opportunities in America by establishing an institution "—wherein a company of people work together toward one common goal—the betterment of American production and the American way of life".

Between the time he came to America in 1874, and the time he "teamed up" with John Johnston in 1898, Mr. Potter had been doing right well in the textile machinery business—having started the Potter & Atherton Machine Co., in Lowell, Mass., and the H & B American Machine Co. in Pawtucket.

Between the time John Johnston arrived in America in 1884, and the time he joined forces with Mr. Potter, he too had been making progress—in his case as a machine designer with Pratt & Whitney. He was chief draftsman when he left that company in 1898 to become co-founder of the company which was destined to be taken over by Pratt & Whitney on March 15, 1948.

The Potter & Johnston organization has earned an enviable name for itself in the field of automatic turret lathes. It long has been recognized as one of America's large and influential builders of production machine tools. Under the aegis of Pratt & Whitney, its future certainly should be no less illustrious than its past.

My good wishes for continuing success go at this time to Clayton R. Burt, president of Potter & Johnston Co., and to J. Potter Cunningham, vice president and sales manager. My hearty congratulations likewise go to Norman R. Earle, former vice president and general manager, for the 40 years of notable service which he gave to Potter & Johnston. I count those men among my best friends in the machine tool industry.

SURVEY OF GEAR INDUSTRY: A short time ago I encountered Newbold C. Goin, executive secretary, American Gear Manufacturers Association, Empire Bldg., Pittsburgh 22, and learned from him about the determined effort which he is making in behalf of the National Security Resources Board, to determine for the first time the "noncaptive" gear cutting capacity of this country.

Mr. Goin has mailed out 700 copies each of two questionnaires—one covering gearing products manufactured, the other gear cutting equipment available. On the first can be checked off open gearing of fine, medium and coarse pitch; enclosed gear units from less than 5 horsepower to over 75 horsepower; marine propulsion units up to 300 horsepower, between 300 and 2000 horsepower and over 2000 horsepower; and light, medium and heavy petroleum pumping units.

On the other form can be checked gearmaking machinery of various kinds made by 19 American companies and eight foreign companies. The number of companies and wide variety of machines is an amazing commentary on the development of the gearing art here in the United States. Obviously this represents one of our strongest bulwarks in national defense—gears being among the most important components in the defense program, just as they are in our mechanized economy generally.

Mr. Goin said: "Possibly we do not have a complete listing of all gearing manufacturers in the United States. You can help along this patriotic effort by calling attention to these surveys and advising any manufacturer who has gear cutting tools—but who did not receive questionnaires—that they can be obtained from AGMA headquarters. All information regarding individual plants will be held in strict confidence."

CONTINUOUS TABLES: In the never-ending effort to design machines which will turn out more things for more people—in less time—machine tool builders have worked long and hard on the problem of "snapping back" work tables in the least possible time.

Friends of mine who build high production woodworking machinery of machine tool quality have called my attention to the fact that they have done away entirely with idle "table return time" by the simple expedient of designing interlocking "linked" work tables which travel continuously at working speed in working direction—like chains around sprockets.

I believe that they've got something there for the machine tool builders.

DETERMINING SMALL AMOUNTS OF CARBON IN STEEL

Low pressure combustion method found to give precise results for low carbon steels, even when used on a routine basis

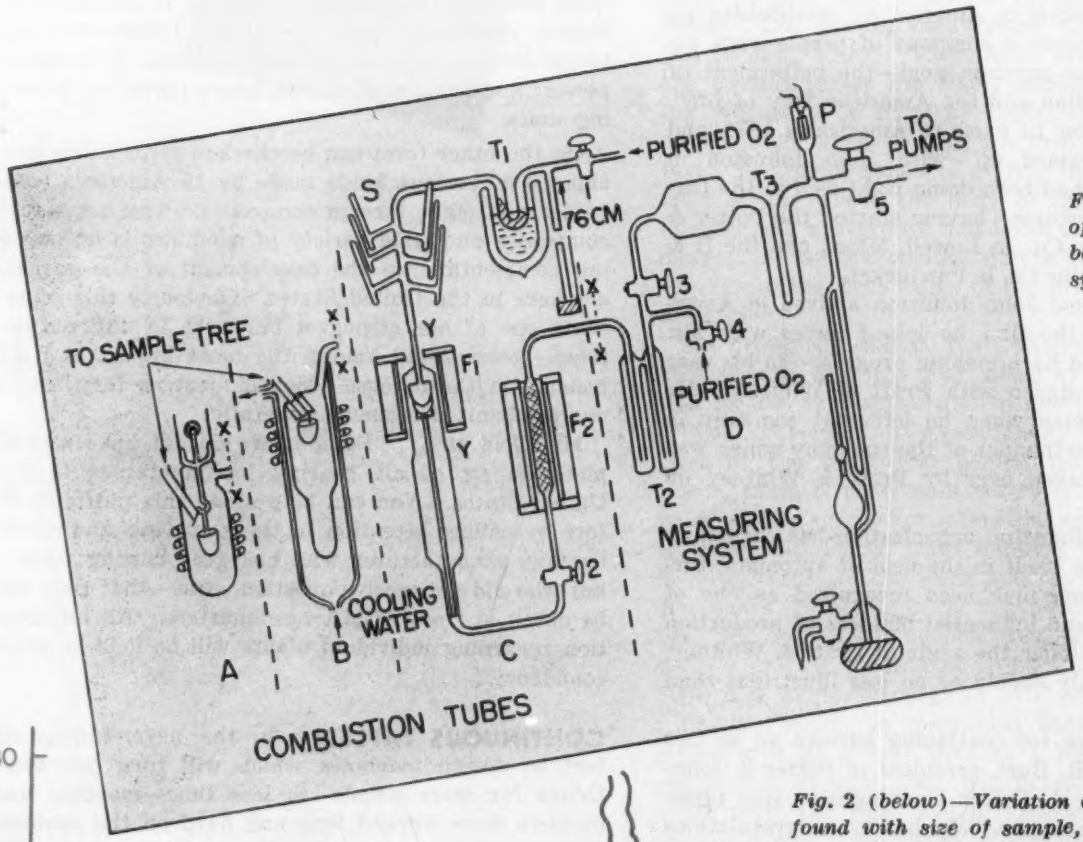


Fig. 1 (left)—Types of combustion chambers and measuring system for carbon determination

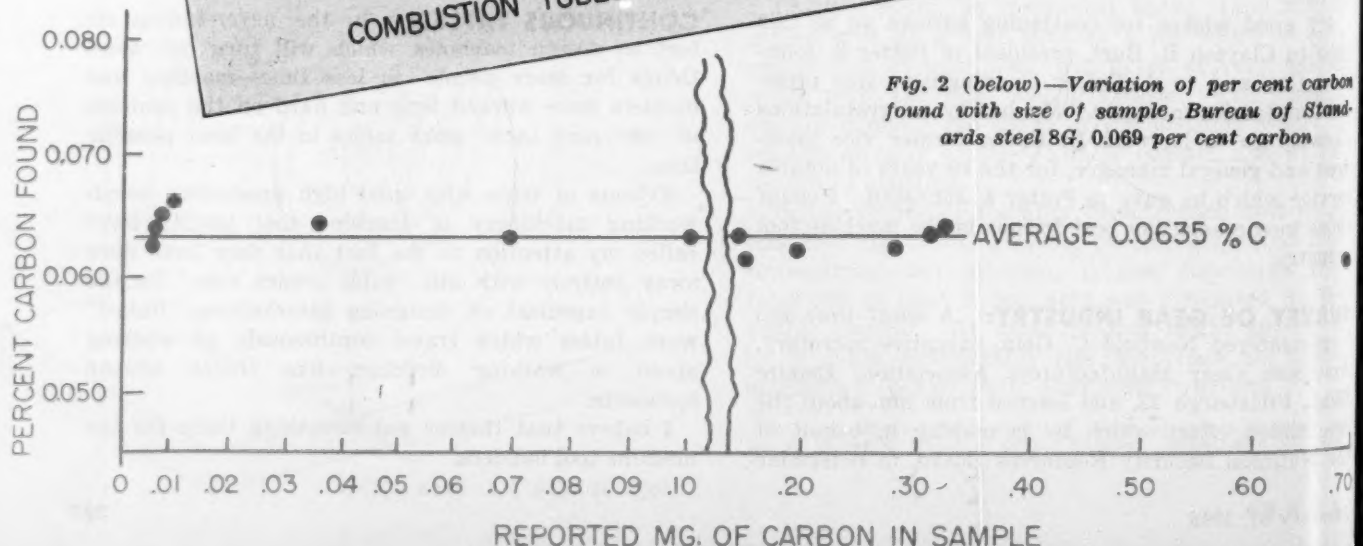


Fig. 2 (below)—Variation of per cent carbon found with size of sample, Bureau of Standards steel 8G, 0.069 per cent carbon

CARBON VALUES OBTAINED BY COMBUSTION AT LOW PRESSURE AND AT ONE ATMOSPHERE PRESSURE

Sample	No. of Detns.	% Carbon Std. Method	Condition of Run	Average Blank		Average % Carbon	Standard Deviation, %
				C, Mg.	C, %		
55A	15	0.014	Low pressure combustion	1.5×10^{-3}	0.0003, 0.5-g. sample	0.0108	0.0003
55A	20	0.014	Low pressure combustion—cooled walls	0.53×10^{-3}	0.00008, 0.5-g. sample	0.0108	0.0003
55A	11	0.014	Atmospheric pressure-O_2 flow	3.1×10^{-3}	0.0006, 0.5-g. sample	0.0105	0.0003
55B	10	0.012	Low pressure combustion	1.8×10^{-3}	0.0003, 0.5-g. sample	0.0095	0.0003
55B	4	0.012	Low pressure combustion-Sn flux	1.2×10^{-3}	.....	0.0098	0.0003
8G	14	0.069	Low pressure combustion	0.6×10^{-3}	.....	0.0635	0.0011
14C	13	0.791	Low pressure combustion	0.7×10^{-3}	0.0015, 0.5-g. sample	0.785	0.008
Sucrose	2	42.1	Low pressure combustion	0.7×10^{-3}	0.025, 0.003-g. sample	42.0	0.1
Piano wire	7	0.88	Low pressure combustion	1.6×10^{-3}	0.003, 0.5-g. sample	0.881	0.0007

EXPERIMENTS conducted in the laboratories of General Electric Co. and reported by the American Chemical Society, have revealed that in the analyses of low carbon steels, the usual method for determination of carbon gives high results. This work, which was carried out by H. H. Uhlig, who has since become director of the corrosion laboratory, Massachusetts Institute of Technology, and J. J. Naughton, currently associated with the chemistry department, University of Hawaii, showed the low-pressure combustion method to be a precise means for the determination of carbon in low carbon steels, even for use on a routine basis. In addition, this method was also found to provide a precise technique for carbon determinations in high carbon steels.

Apparatus—The essential elements of the apparatus employed are illustrated in Fig. 1, utilizing furnace A and measuring system D. Modification systems B and C, also shown in this illustration, were used in experiments to trace systematically any nonevident sources of error in the low pressure method. In carrying out the procedure, the steel sample is burned in an all-glass apparatus; carbon dioxide is collected by condensation in a low-temperature trap, which is liquid nitrogen cooled, and, after the excess oxygen has been pumped out, the carbon dioxide is determined by a pressure measurement in a calibrated volume. Weight of the sample used depends on the carbon content; for example, for low carbon values in this apparatus the weight used is 0.5-gram, and for higher carbon contents it is proportionally less.

Procedure—Sample is burned in oxygen at 15 to 20 centimeters of mercury pressure in a beryllia or alumina crucible, which is contained in a platinum crucible heated by high frequency. After combustion is completed (5 minutes), the excess oxygen containing the gaseous products of combustion is pumped out through the water trap, T_2, and the carbon dioxide trap, T_3, Fig. 1.

When pressure in the system is pumped to a value of 10^{-4} millimiter or better, as indicated qualitatively by the thermocouple gage, P, stopcocks 3 and 5 are closed, the carbon dioxide trap is allowed to warm up, and the pressure of the carbon dioxide released in the known volume of the system is measured by means of the McLeod gage. A simple calculation converts this to per cent carbon in the original steel sample. Carbon dioxide collected in the U-type trap at liquid nitrogen temperatures can be quickly released by immersion of the trap in water. Such traps are shown by experiment to remove carbon dioxide completely from an oxygen stream under conditions of the test and their use greatly speeds up the determination.

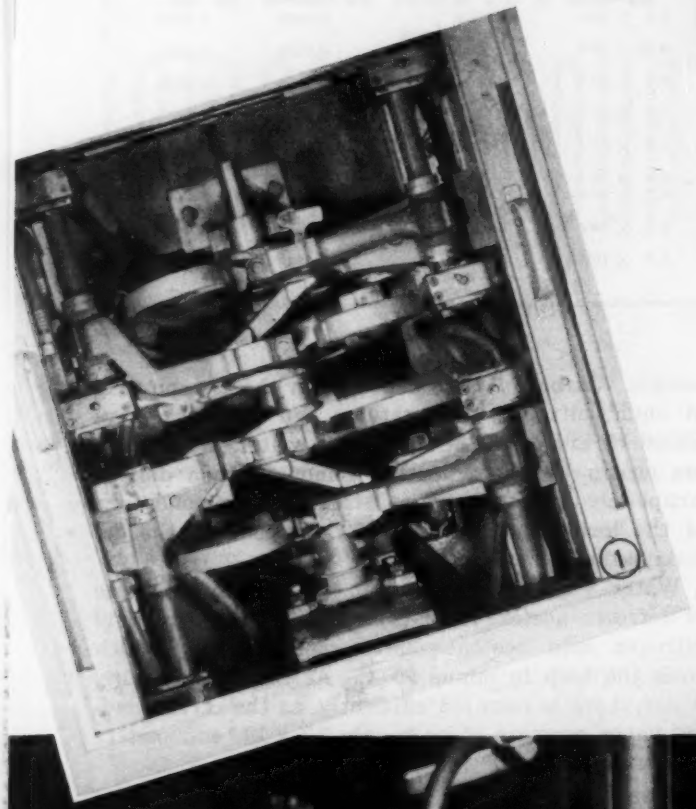
Water vapor is removed in trap T_2 by the use of a frozen acetone bath (obtained by pouring liquid nitrogen into acetone-solid carbon dioxide) which cools the trap to minus 95° C. At this temperature, water vapor is removed efficiently, as the corresponding vapor pressure of ice is only 2.7×10^{-5} millimeters of mercury.

Results—Results of a series of runs are shown in the accompanying table. No difficulties or unusual deviations were experienced in making determinations on small samples (as low as 0.005-gram) of high carbon steel. This was true for both the commercial steel examined and for the Bureau of Standards steels. Another feature of the results that can be noted is the agreement between the results by the standard method and by the low-pressure combustion method for high carbon samples. It was pointed out by Naughton and Uhlig, in discussing the results of their experimental work, that this agreement, true only for high-carbon steels, is the result of a corresponding lower percentage error in the standard method, introduced, for example, by the amount of carbon dioxide absorbed by the boat and liner material on exposure to the air, or to sulphur dioxide that might be entrapped with the carbon dioxide. Errors thus introduced are small, when compared with the large total amount of carbon dioxide resulting from combustion of the relatively large sample used in the standard procedure. For example, 0.01 to 0.05-milligram of carbon (average 0.02-milligram) can be absorbed from the air by an alumina boat. Therefore, a 0.8 per cent carbon sample, factor weight 1.36 grams, would give 10.9 milligrams of carbon with a corresponding error of 0.2 per cent. However, on the other hand a 0.01 per cent carbon sample, factor weight 2.72 grams, would give 0.272-milligram of carbon and involve an error of approximately 7 per cent.

Hence, for low-carbon steel, a difference exists between the two methods such that the usual standard method gives high (*Please turn to Page* 74)

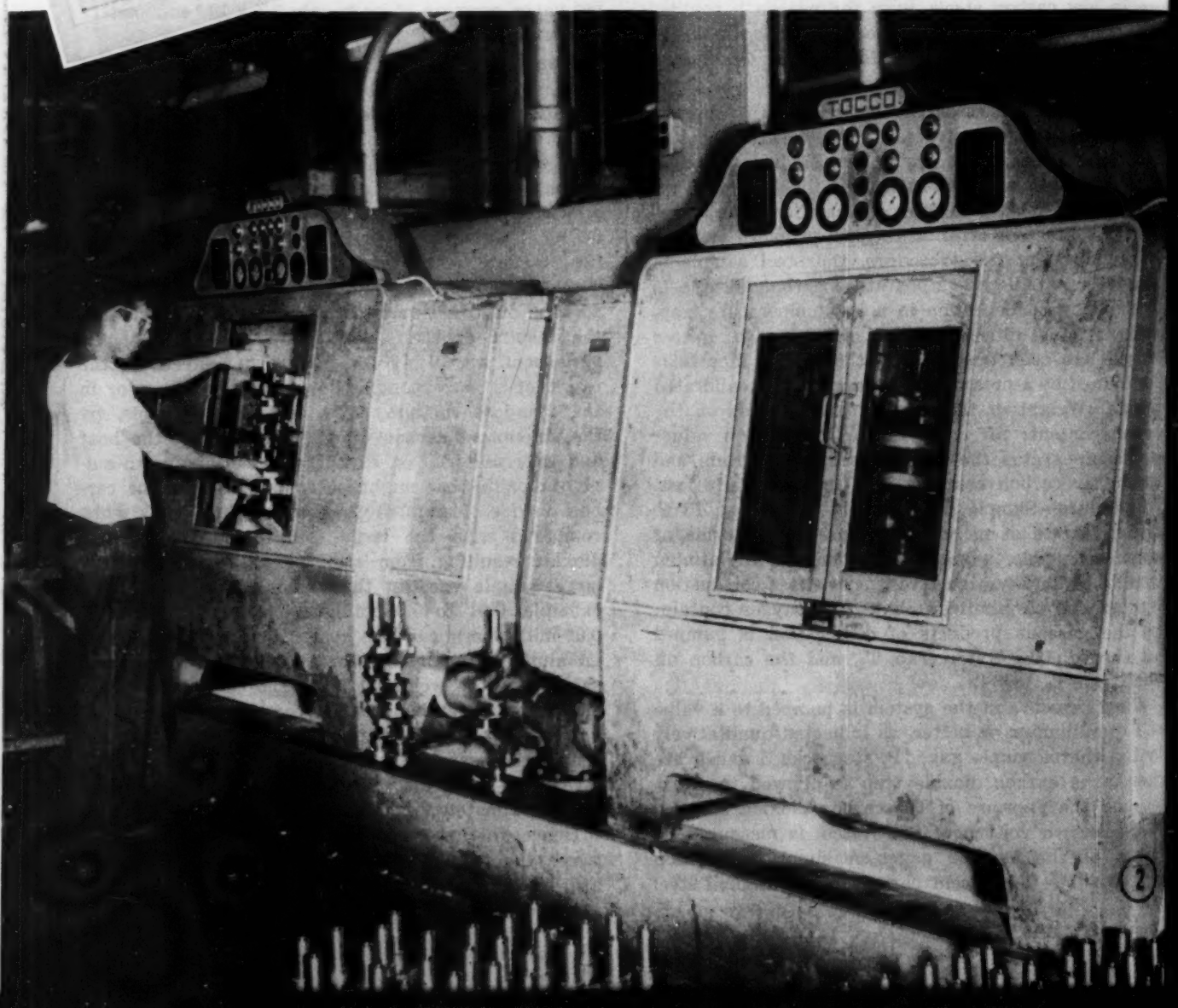
Versatility of Induction

. . . exploited in



ECONOMY and efficiency of induction heating are being utilized to the fullest extent in International Harvester's new Louisville tractor plant. This new tool is used in heating for forging, hardening, tempering, brazing, soldering and shrinking. The plant uses over 6000 kilovolt-amperes in high frequency power, ranging from 60 to 450,000 cycles.

Forging—The entire forge shop, consisting of four upsetters, five presses and two bulldozers, is equipped with induction heaters, heating approximately 16,000 pounds of steel per hour, from 1-inch round to 4¼-inches square. Steel is heated in a continuous billet heater in which sheared lengths push each other through an induction coil, or in a bar heater in which one end of a bar is heated to a specified length.



By J. D. GRAHAM, H. F. KINCAID
and R. E. McGEE
International Harvester Co.
Chicago

Induction Heating

producing tractor parts

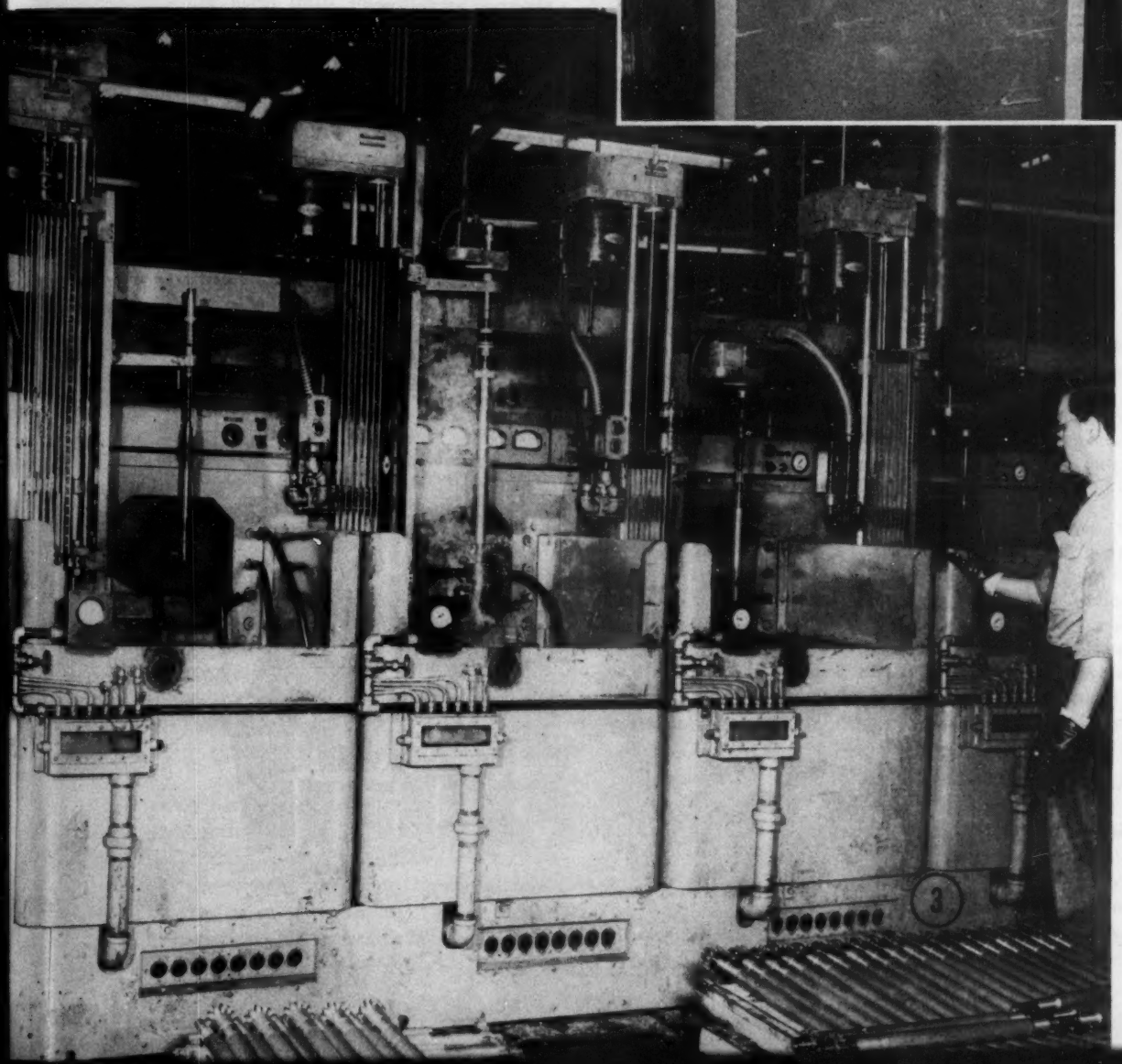
New tractor plant uses 6000 kva high frequency power, ranging from 60 to 450,000 cycles to induction heat parts in several manufacturing operations

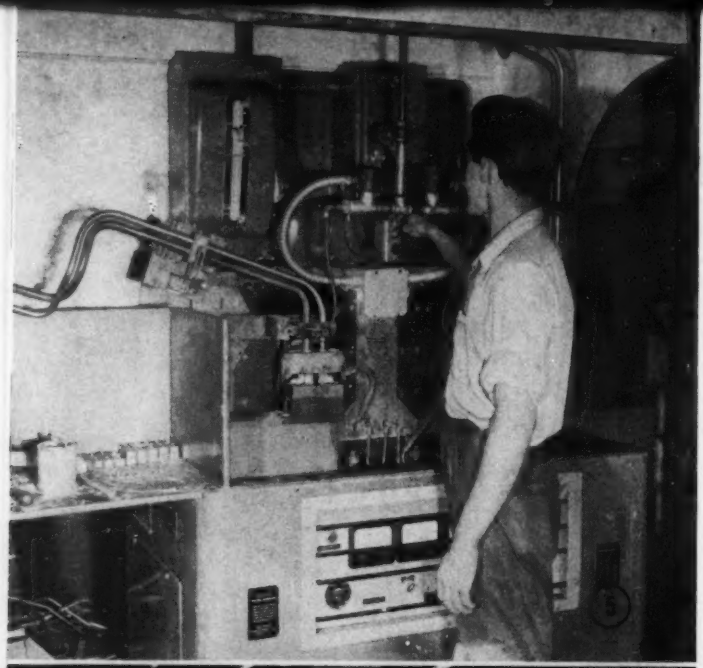
Fig. 1—Air locks hold split inductor blocks in place during hardening of crankshaft

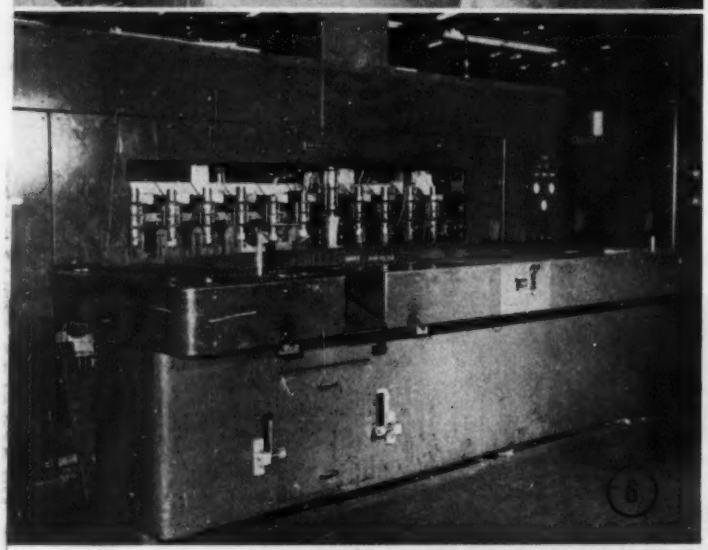
Fig. 2—Crankshaft pin and main bearings are hardened by 9600-cycle power at this two-station machine

Fig. 3—Partial view of a 12-station hardening unit powered by two 150-kilowatt 9600-cycle water-cooled generators

Fig. 4—Low frequency (60-cycle) unit for heating bull gears for shrinking on hub







In the larger sizes, heat application favors the surface, but temperature is equalized during the transfer of the heated steel from the heating unit to the forging machine. Power for these heaters is supplied by three hydrogen-cooled 3000-cycle generators each of 1250 kilowatt capacity and four water-cooled 9600-cycle generators, each of 150 kilowatt capacity.

Use of induction heat in the forge shop results in the following advantages:

1. Increased production. No furnace warm up or wait for bar heating is required.
2. Greater die life. Formation of very light scale, as well as uniform temperatures extends die life measureably.
3. Reduced material cost. Due to the absence of scaling and decarburization, smaller stock sizes and less stock removal in machining may be used.
4. Improved working conditions. The heating unit is cold to the touch; only the heated piece can radiate.

Heat Treating—Techniques of heat treating by induction at Louisville works vary greatly with a total of 1560 kilowatt power varying from 60 cycles to 450,000 cycles. Choice of frequency, power, quench, hardness pattern etc. is of extreme importance in application of induction heat and must be based on experience. Work at Louisville may be roughly grouped as follows:

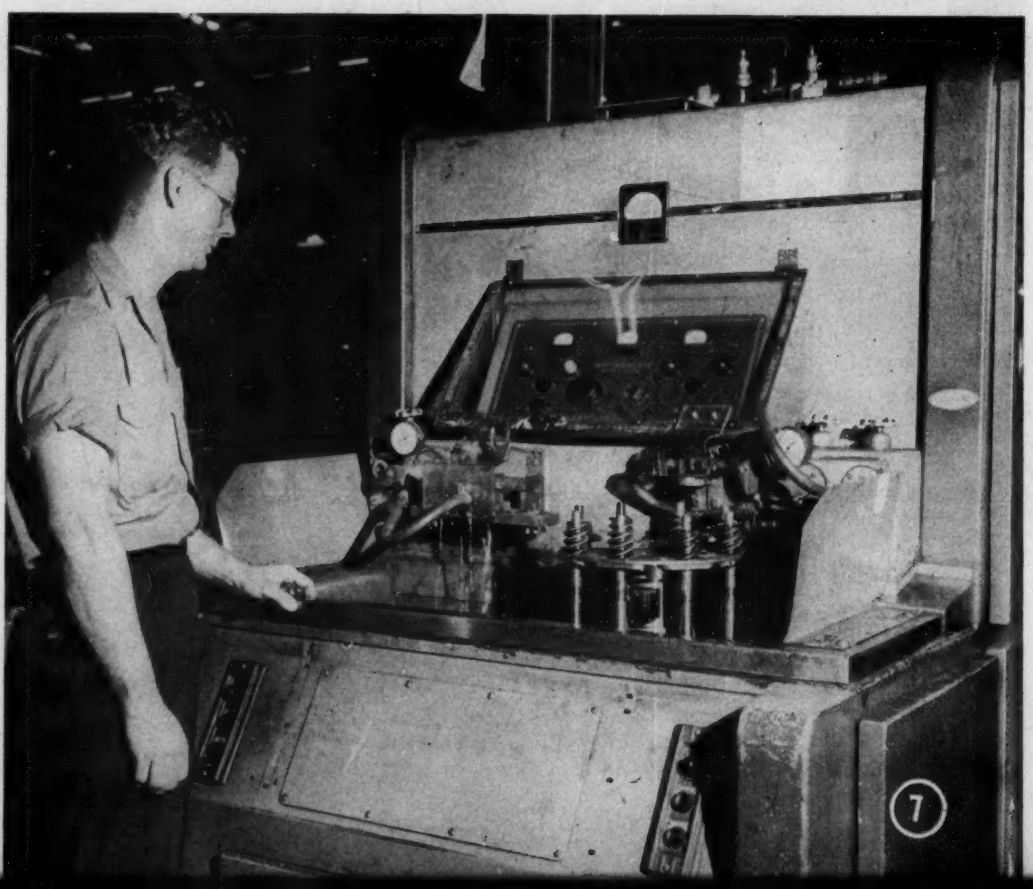
1. Heavy gears (6 pitch and heavier). Preheat with 60 cycles to about 700° F. Heat teeth with 9600 cycles to hardening temperatures and quench in high pressure oil in submerged spray (40-90 pounds per square inch).

Hardness pattern extends through teeth and below root diameter. (*Please turn to Page* 80)

Fig. 5 — Silver brazing hydraulic tube assemblies is accomplished on this 20-kilowatt 9600-cycle unit

Fig. 6 — High speed automatic machine for radio frequency hardening transmission gears. Production rates up to 800 gears per hour have been obtained

Fig. 7—Self-contained two-station 20 kilowatt machine for radio frequency hardening small parts



Measuring STEEL BATH TEMPERATURES

. . . by purged tube method

Fig. 1— Electronic bath pyrometer-recorder

Fig. 2 — Immersion tube

FOR a number of years, one of the leading steel companies has worked within its own organization to modify and perfect the purged tube method of measuring steel bath temperatures. This design makes use of a photoelectric cell mounted at the rear end of an air purged immersion tube.

Output from such a cell, when calibrated in terms of temperature, is approximately a twelfth power function of absolute temperature which provides an extremely open scale at normal operating temperatures. About 3 years ago an electronic indicating and recording pyrometer, with special modifications, was developed by Brown Instrument Co., Philadelphia, for use with this measuring unit, thus greatly simplifying the previously used measuring instrument. In addition, this measuring circuit design provided excellent stability to the calibration characteristics of the measuring cell. The new system is shown in Fig. 3.

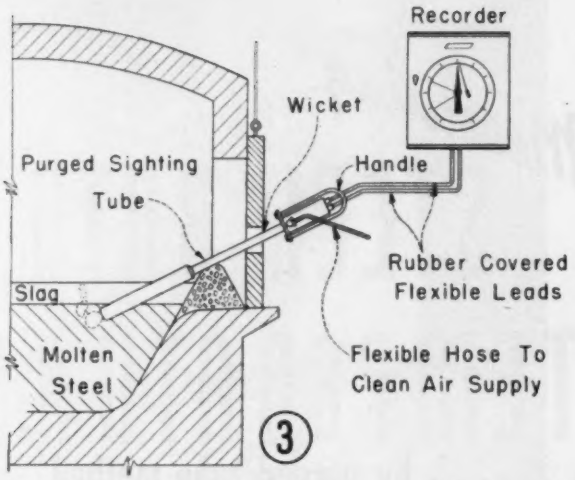
Potentiometer—In Fig. 1, the scale and chart are graduated 0-3100°F with approximately 12th power graduations to correspond with the photocell output. The standard Brown potentiometer is modified somewhat to provide remote energizing of the balancing motor through the pushbutton on the immersion unit. The balancing motor is also energized when the standardizing button is depressed. Amplifying unit and 24-hour chart drive circuit are continuously energized, giving immediate response to temperature indication when pushbutton on the purged sighting tube is depressed, and continuous indication of last temperature reading plus the exact time the temperature was taken.

Using compressed air for purging, the instrument reading for open-hearth steels in the range of 2900° to 3050°F is established to correspond to the usual plant practice in measuring tapping temperatures with an optical pyrometer using an emittance value of 0.40. This calibration also permits the use of a check on the operating floor by reading back wall temperatures with the purged sighting tube and comparing with optical readings set for black body conditions.

Recent studies indicate that molten steel in air has an emittance of about 0.50 at 3000° rather than the commonly used value of 0.40. Thus the usual optical readings made during tapping on the basis of 0.40 are from 40° to 60° higher than actual bath temperatures in the usual tapping range. When air is used for purging the inner surface of the steel cavity formed by the air pressure, the inner surface is believed to be oxidized by the air and this causes a higher than actual steel temperature reading. Where absolute temperature measurements are to be made, the tube can be purged with an inert gas such as nitrogen or the instrument can be calibrated to true bath temperature values.

Purged Sighting Tube—The sighting tube, Figs. 2 and 4 is approximately 7 feet long, which is sufficient to permit the required immersion in the open-hearth bath even if the doors are highly banked. The tube weighs 75 pounds and consists of a 2-inch standard pipe size outer tube screwed into a 2⅞-inch outside diameter sleeve of cold drawn steel, with an air-cooled 1⅞-inch outside diameter seamless inner tube inside the full length. A low carbon steel cap with a 0.6875-inch orifice is located at the immersion end of the tube, a light-sensitive cell of the photo voltaic type in the other, and interposed between are 8 sight-limiting diaphragms which intercept all stray reflections from the inner surface of the inner tube.

There is a clear glass window located in front



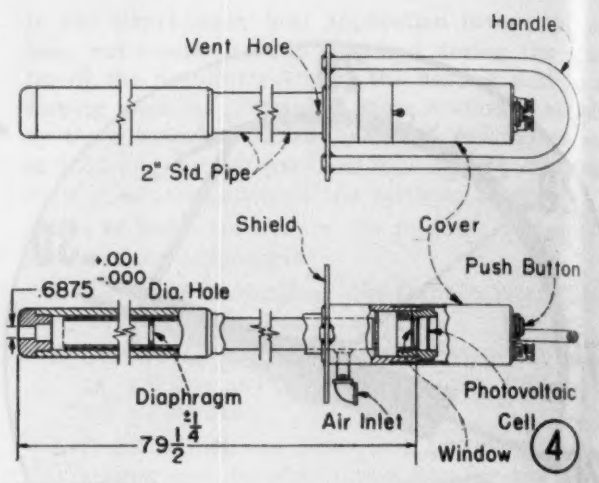


Fig. 3 — Photoelectronic bath pyrometer system for measuring molten steel temperature

Fig. 4—Purged sighting tube for photoelectronic bath pyrometer

of the photocell for the purpose of protecting it against the purging air pressure, and yet transmits light rays of the correct wave lengths for proper operation of the cell. The compressed air which purges and cools the inner and outer tube is introduced at approximately 8 to 9 pounds so that a continuous flow will be maintained when the tube is immersed in the bath, thus preventing the admission of molten steel and slag into the immersion orifice.

Air flow during operation is estimated at 60 cubic feet per minute. Distribution of air flow is about 90 per cent of total air flow between outer and inner tubes with remaining 10 per cent through inner baffled tube. A dependable regulated supply of clean air from which all traces of oil and water have been removed is essential to the operation of any purged sighting tube.

A calibrating unit for checking the photocell consists of a modification of the Optimatic calibrating unit with light source adapted for use on the photocell. One calibrating unit is required for each open-hearth shop.

Operation — The operator places end of the air purged immersion tube through the door wicket and dips the end of the tube into the slag once or twice so that the slag adheres to the tip of the tube. Slag coating protects the tube. He then lowers the tube into the bath so that it is immersed about 6 inches in the molten steel. Air flow through the tube provides cooling and also prevents the admission of molten slag and steel.

Air forms a cavity in the steel into which the photoelectric cell is sighted. As soon as the end of the tube is submerged in the steel, the operator depresses the pushbutton on the tube for several seconds or until the instrument pointer comes to rest. Tube is then removed from the furnace, and adhering slag or steel is scraped off on the wicket hole as the tube is withdrawn. This entire operation does not take longer than 10 seconds. It usually requires about 2 to 3 seconds to slag the tube and another 4 to 5 seconds to complete the measurement and remove the tube from the molten steel.

Recorder is usually located on the instrument panel for each furnace or on a separate panel that is clearly visible to the operator when using the tube.

Thermocouple vs. Immersion Tube —Widespread use of both platinum thermocouple and immersion tube methods of steel bath temperature measurements under commercial operating conditions has proved these tools for open hearth operations. The thermocouple method has to date been preferred on electric furnaces and small open hearths, due to the air purge splashing molten metal on the refractories and causing undue spalling and the possibility of excess oxidation of small baths.

At one steel plant, cost per temperature reading, using the immersion tube, is about 10 cents. This includes cost of checking and calibrating the pyrometer, and all replacement immersion tube parts. Three thousand readings were taken at a total cost of $308.00.

Operating Economies—Simple answer to the important problem of bath temperature measurement can be provided by the photoelectronic bath pyrometer system. Among the operating economies are:

1. Increased ingot production through reduction of "skulls" and stool stickers, increased ladle and furnace life.
2. Improved quality of ingots due to better control of refining temperatures.
3. Decreased fuel consumption by providing an accurate measurement of steel temperature. Steel need not be held in the furnace any longer than necessary.
4. Low operating cost which is dependent upon individual shops but which is in the order of 10-20 cents per reading.

The following improvements are reported in pouring practice:

1. Pounds of skulls per heat reduced from 743 to 350 pounds.
2. Ladle lining life increased 50 per cent (from 13 to 18 heats per lining).
3. Number of heats with skulls reduced from 4 to 1.9 per cent.
4. Number of heats with large skulls reduced from 4.4 to 1.9 per cent. Stool stickers reduced 75 per cent.
5. Optimum bath temperature for each grade of steel at this plant varies between 2990° and 3020°; 20° higher bath temperature is used for cold ladles and a reduction of 20° for hot ladles which have been used within an hour. Twenty degrees hotter is desired for pouring ladles with 1½-inch nozzles in place of 2-inch.

Deep-Drawing Lubricant Not Offered on Market

Deep-drawing lubricant used by Zierold Mfg. Co., Burbank, Calif., STEEL, p. 69, Jan. 10, 1949, in connection with its operations is reported by the company to be a self-developed product. Therefore it is not being offered on the market, and it is not the intention of the concern to do so.

The lubricant, the company explains, can only be used successfully when employed with its exclusive processes and die design.

Continuous Pickling Lines

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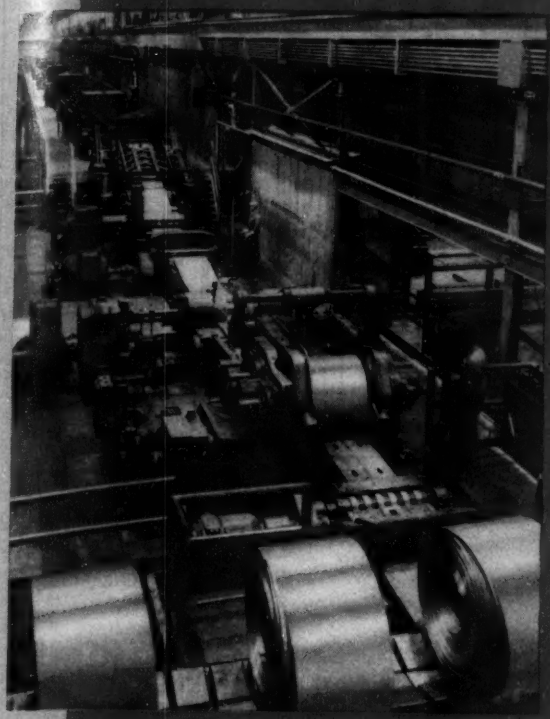
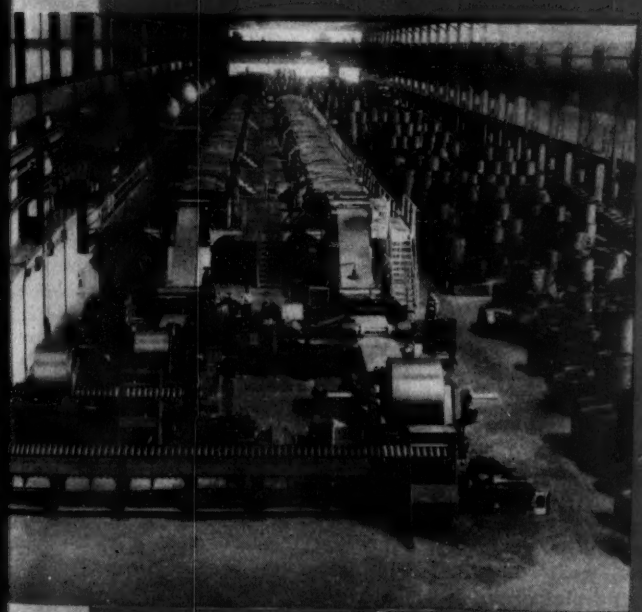
MESTA



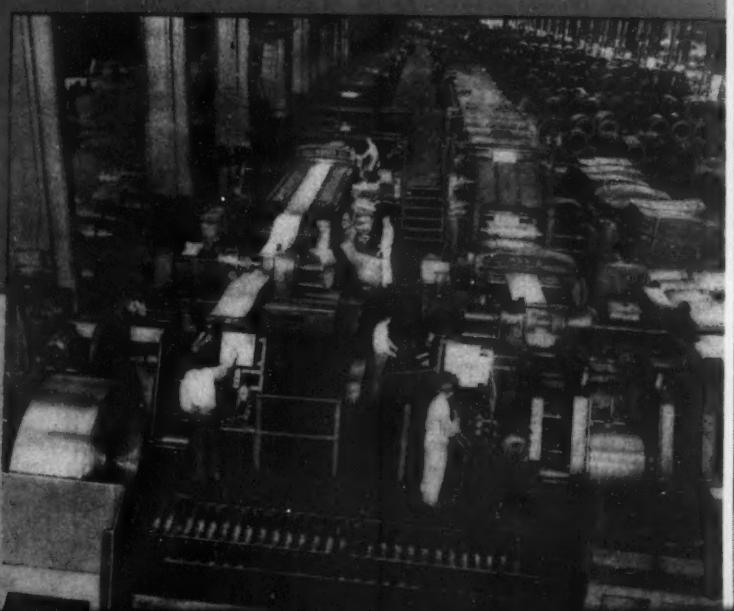
Mesta 42" Continuous Pickling Line

Mesta 93" Continuous Pickling Line



Mesta 66" Continuous Pickling Line

Mesta 66" Continuous Pickling Line with Trimmers and Upcoilers



Designers and Builders of Complete Steel Plants

MESTA MACHINE COMPANY

PITTSBURGH, PA.

Design Suggests Means for Reducing Time of OPEN-HEARTH HEATS

Movable roof section permits rapid charging of scrap. Pouring nozzle built into furnace bottom affords tapping the heat directly into molds, casting machine or ladles. Innovations more readily applicable to new melting units

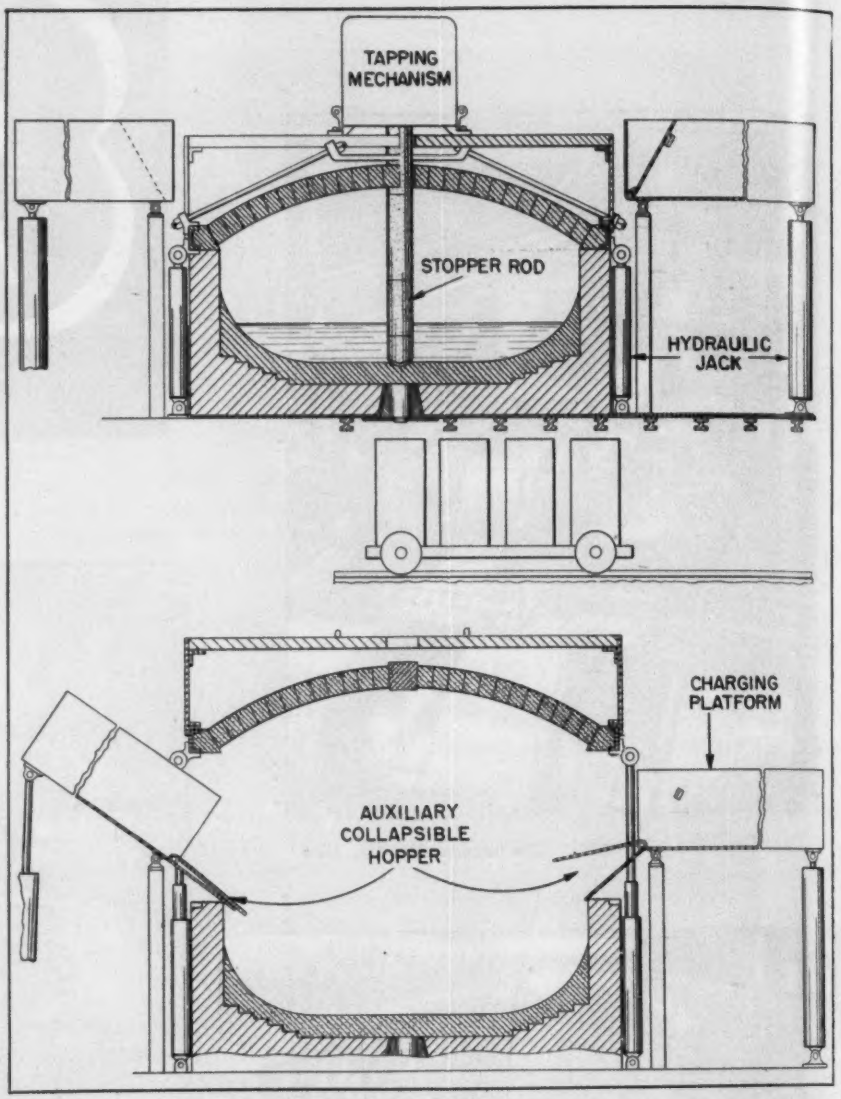


Fig. 1 (top)—Cross section through furnace showing movable roof section in working position and with tapping rigging lowered into place through roof

Fig. 2 (bottom)—Cross section of open-hearth furnace with movable roof section elevated to permit charging

MODIFICATION in the design of open-hearth furnaces is involved in a plan which suggests a reduction in capital investment. The new design, as shown in the acompanying illustrations, has the main roof of the furnace between knuckles resting on skewbacks which in turn are carried on vertical plunger rods of hydraulic jacks. By this arrangement the main roof section between knuckles can be raised or lowered, though an overhead crane may be used to raise the roof if desired.

Along each side of the furnace are charging platforms, with the inner edges pivoted to a supporting column and the outer edges supported by the plunger elements of jacks in a second hydraulic system. These charging platforms extend for the entire length of the movable roof section, and receive the scrap that is to be charged into the furnace. Auxiliary hoppers, hinged at the inner ends of the charging platforms, (Fig. 2) may be used for miscellaneous materials, such as manganese, carbon, etc. The auxiliary bins may be collapsed, as shown at the left of Fig. 2, to form a chute for the scrap entering the furnace. When the auxiliary bin is pulled up into its normal position (Fig. 1), it forms the inner side of the charging platform.

Thus, while a heat is in progress, scrap for the next heat may be placed in the charging platforms, directly from railroad cars, by magnet crane or similar means. When it is time to charge the heat, the roof is raised, the charging platforms tilted, and the scrap slides into the furnace. This operation is completed rapidly, and the movable roof section is then lowered and melting begun. If recharging is necessary, it is again but a matter of seconds to put more scrap into the furnace.

Another departure from the usual open-hearth design lies in the method of tapping. Instead of the usual tapping hole at the back of the furnace, this design is provided with a pouring nozzle built into the bottom of the furnace hearth (Fig. 1).

When it is time to tap the heat, a combination stopper rod and drill is inserted through a hole in the roof immediately over the tapping nozzle in the hearth. Rotation of the stopper rod, which carries at its lower end a cutting tool, forms a seat for the stopper rod in the hearth. A drill then may be inserted through the hollow center of the stopper rod and rotated until it pierces through the furnace bottom. The heat then can be tapped by raising and lowering the stopper rod as desired. The mechanism for rotating, raising and lowering the stopper rod and drill is contained in a unit at the top of the rod (Fig. 1).

Molten metal flowing from the fur-

nace may pass directly into ingot molds which pass beneath the tapping nozzle, or into a suitable casting machine, or into a ladle. Thus, ingots may be poured direct, or pig scrap or hot metal made for further refining in electric furnaces, open-hearth furnaces, etc. All, or any part, of the molten metal can be tapped, and any desired alloying element or other agent can be added to the metal through the hollow stopper rod. Any desired analysis therefore can be produced.

When the tap has been completed, material may be rammed through the hollow stopper rod into the hole that was drilled through the furnace bottom. The pouring nozzle then may be replaced. Finally, the stopper rod assembly is removed and the rod seat in the hearth is dressed over.

It is apparent that the charging method permits the use of various grades of unprocessed scrap, from light, bulky material to large, oversize sections. Hence, a cheaper charge material is possible. Since little or no scrap preparation is necessary, most of the scrap can be unloaded directly from railroad cars on to the charging platforms of the furnace, thus eliminating charging machines, charging boxes and buggies, and reducing scrap yard requirements materially.

The tapping feature also eliminates some of the conventional expensive equipment, to an extent depending on whether ingots, pig scrap or hot metal is desired from the process.

The operating crew for a unit having these new features might well be considerably smaller than for conventional open-hearth installations, while the rapid charging should result in maximum production, with consequent reduced operating costs.

The innovations in the general plan are more readily applicable to new melting units than to existing facilities. The tapping and pouring method, with the layout it requires, might be impossible to put into an existing open hearth shop. However, the charging method, by moderate changes, can be applied to many existing shops, which might gain considerable production through fast charging thus afforded.

One or more of these melting units might be constructed in a scrap-producing area at a cost that will permit profitable operation, producing ingots for rolling or, if residuals make this impossible, controlled heavy melting scrap. Special scrap to meet the requirements of foundries or other processes may be a profitable product in some cases.

These arrangements were designed by F. W. Gumpp, Massillon, O.

ONE COMPLETE, ONE TO GO: These two continuous galvanizing lines, the one at the left of heavy gage steel and the right for lighter gage, are postwar projects of U. S. Steel being installed in Carnegie-Illinois' Irvin works at Dravosburg, Pa. The heavy gage line, already completed, starts at the lower left where the steel coil unreels into the leveler. Electrolytic cleaning, induction heating and annealing follow in line before the endless strip dips into the zinc galvanizing bath. Coated steel climbs tower in background to cool and moves on through washing, shearing and stacking. The lighter gage line is scheduled for completion shortly

ASTM Publishes 1948 Copper Standards

Publication of 1948 standards on copper and copper alloys, including 106 standard specifications, test methods, definitions of terms, etc., is announced by Committee B-5 on copper and copper alloys and other technical committees of the American Society for Testing Materials, Philadelphia.

Included are 16 specifications covering copper and copper alloy wire and cable, three for alloy conductors, 12 covering copper and copper alloy plate, sheet and strip, five on cartridge case cups, tube plates, rolled copper alloy bearing and expansion plates, etc., and 18 for wire, rods, bars and shapes, free-cutting brass rod, copper-silicon alloy wire, phosphorus bronze wire, leaded red brass and beryllium-copper alloy wire, six covering all kinds of copper pipe and four for brass pipes.

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Often eliminates need for costly alloys in product.

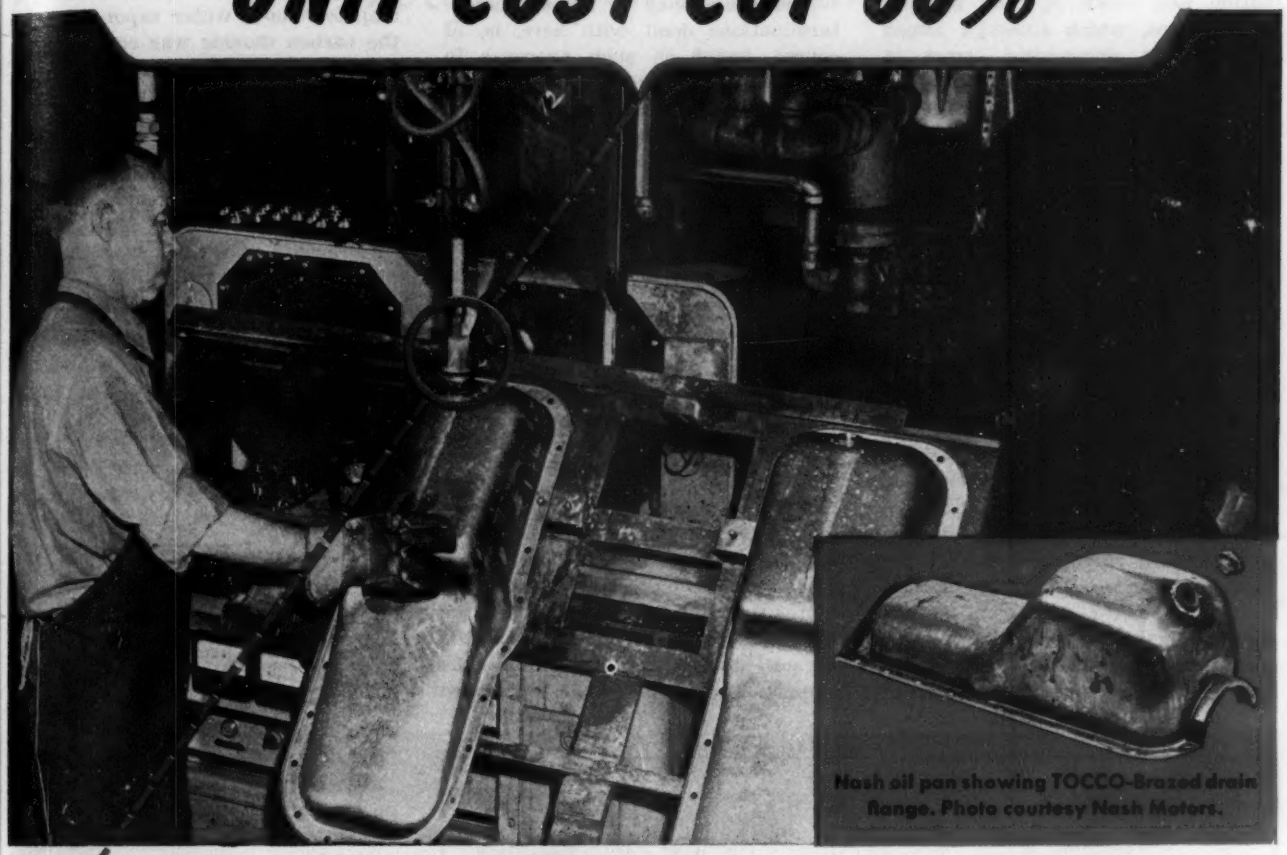
Saves floor space. Improves working conditions.

with TOCCO* Induction Heating

IF you are concerned with the profit and loss figures of your company don't overlook the cost-cutting possibilities of TOCCO Induction Heating. America's leading metal-working plants have found that TOCCO can speed production and lower unit costs in hardening, heating for forging and brazing applications.

Look how NASH did it

PRODUCTION TRIPLED! UNIT COST CUT 60%



Nash oil pan showing TOCCO-Brazed drain flange. Photo courtesy Nash Motors.

with TOCCO* Induction Heating

Even if your products are entirely different in size and shape TOCCO can probably provide similar cost reductions and production increases for you.

• *Nash Motors,* Kenosha, Wisconsin reports the following benefits from TOCCO Induction brazing of drain flanges to automobile oil pans:

1. PRODUCTION TRIPLED— Using a hand torch, production was only 21 brazed assemblies per hour. TOCCO brazes 75 per hour—357% of former output!

2. COSTS CUT—At the same time TOCCO Induction brazing cuts labor and material costs from $12.75 to $4.90 per hundred—a reduction of 60%, representing a saving of $6.00 every hour.

3. OTHER ADVANTAGES—include a neater, better looking brazed joint, and a complete elimination of leakers and subsequent repair costs.

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Small Amounts of Carbon—*Continued from Page 61*

results. This conclusion was reached after a thorough systematic examination and check of each step in the analyses, which although aimed originally at uncovering errors in the low-pressure combustion method, finally disclosed errors instead in the standard combustion method.

In discussing the results obtained by the low-pressure combustion method, it was pointed out that the difficulty of the difference between carbon results by the two methods can be resolved by recognizing that the limitations of the combustion-weighing method sets the apparent limit of accuracy of this method to not better than 0.003 per cent carbon for the factor weight. For low carbon determinations it can be observed that the discrepancies fall within this error, for example, Bureau of Standards sample 55B, 0.012 per cent by the standard method vs 0.0095 per cent, by the low-pressure combustion method. However, were each method equally accurate and the error in each case of an indeterminate nature and purely random, the mean of many determinations by each method should more nearly coincide. The observed discrepancy for low-carbon determinations dealt with here, is, of course, based on such averages in each case. Judging the data obtained, the conclusion was drawn from the work of Uhlig and Naughton that the low pressure combustion method meets present requirements for analysis of low-carbon materials with respect to both high precision and accuracy.

Oxygen Flow Method — For purposes of verifying the above results, a series of experiments was also run using an oxygen flow method. The equipment used is shown in Fig. 1, C and D. The experimental procedure followed was essentially as described below:

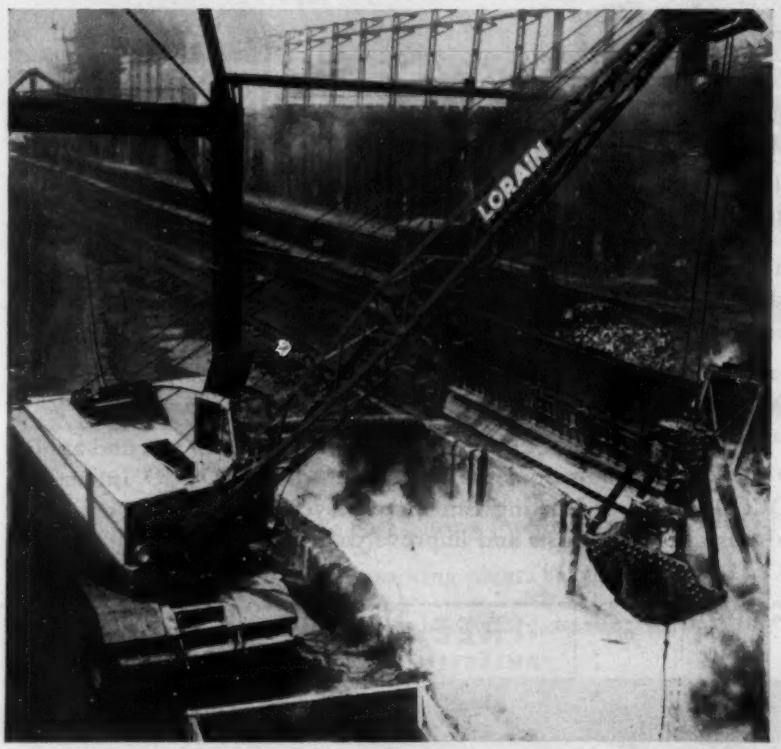
Oxygen at one atmosphere flowed over a beryllia crucible contained in a quartz combustion tube heated by a platinum-wound furnace. This eliminates the troubles resulting from the platinum film in contact with the carbon dioxide released from the sample. The samples could be dropped into the furnace for combustion without opening the system. Gases resulting from the combustion were pumped over a platinum catalyst to oxidize the sulphur dioxide and through a frozen acetone freeze-out trap to remove water vapor. Finally, the carbon dioxide was condensed in a liquid nitrogen trap and, after removal of the excess oxygen, was released into a known volume and its pressure was measured. Thus, the quantity of carbon could be determined as in the low-pressure method. The results, as can be noted in the table, are in agreement with the low-pressure method.

It was brought out by Naughton and Uhlig, in discussing some of the possible errors in the low-pressure method, that after several combustions an appreciable film of platinum (confirmed by x-ray) collected on the glass walls of the combustion chamber. The film probably results from the formation and possible later decomposition of an oxide of platinum. The suspicion was entertained that this platinum film, acting as a sort of "getter" might absorb some of the carbon dioxide present in the system during a run or during an initial blank run. The experiment above contributes evidence to the conclusion drawn from other experiments, that while the platinum film collected on the furnace wall does absorb some carbon dioxide, the amount is not sufficient to affect the results of low carbon determinations.

Blank—The small amount of carbon dioxide absorbed by the platinum film can probably account for the blank in the low-pressure equipment. This is indicated by the following results. Thorough degassing of the walls by heating in the presence of oxygen reduces the blank 3 to 10-fold. A special furnace tube was built (Fig. 1, B) which was designed in such a way that all surfaces that would collect platinum could be water-cooled. The operation of this equipment was identical with that of the apparatus previously used. Purpose of the water cooling was to reduce desorption, through heating of the glass wall during a run, and thus reduce the blank, if the latter was due to desorbed carbon dioxide. The blank was found to be lower by a factor of about 3 (see table).

Consequently, to obtain low blank values and to increase precision, it is best to keep the walls of the combustion chamber as free of platinum film as possible. A cleaning every ten runs will suffice. Use of fused pure alumina or beryllia crucibles also leads to increased precision.

Incomplete Oxidation of Carbon—



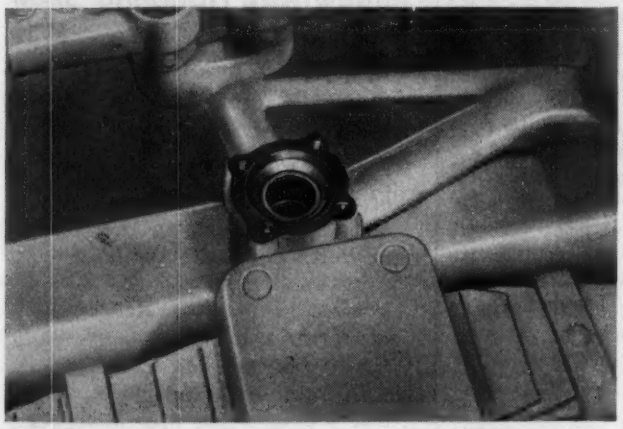
DUAL PERSONALITY CRANE: Equipped with a clamshell bucket, this model TL-20 Moto-Crane, made by Thew Shovel Co., Lorain, O., is cleaning the coke dust from a quenching pit at the Republic Steel Co.'s Cleveland plant. Equipped with an electric magnet attachment, the same mobile crane sees another use in handling steel scrap throughout the plant

Torrington Needle Bearings

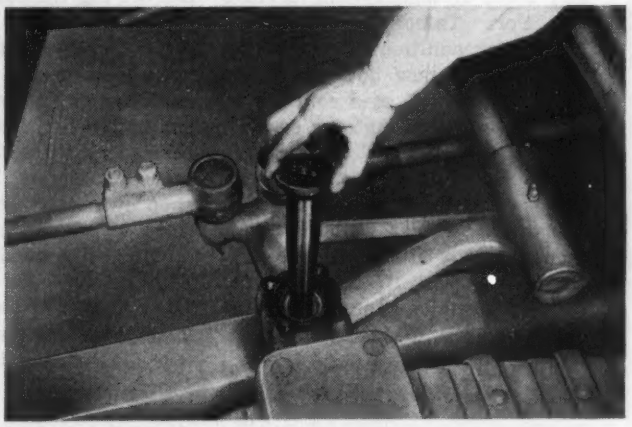
Keep Upkeep Down

in "Caterpillar" Diesel Tractors

Heavy farm chores and tough construction jobs are a matter of course for "Caterpillar" Diesel DW10 Tractors. One feature owners like is a rugged design needing little upkeep. In governor, brake pivot shaft, steering gear and steering bellcrank, long service life is secured with efficient Torrington Needle Bearings.

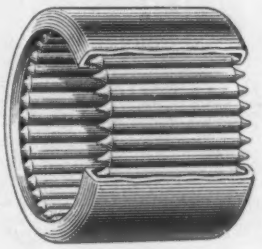


The bellcrank application in steering control shows how these high-capacity, anti-friction units fit into compact designs. Two Needle Bearings mounted with close fits keep mating parts in alignment. Freedom from wear maintains close bearing clearances and eliminates the need for readjustment.



Related parts of the assembly are simple—a plain machined bore for a housing, a hardened and ground shaft for an inner race. Fabrication is easy, and installation a quick arbor press operation. No retaining devices are needed. Such Needle Bearing features help keep manufacturing costs down.

Machinery you build or operate can be improved in operation and service life with Torrington Needle Bearings. Consult our engineers on your specific application requirements. THE TORRINGTON COMPANY, Torrington, Conn. or South Bend 21, Ind. District offices and distributors in principal cities.



TORRINGTON NEEDLE BEARINGS

Needle • Spherical Roller • Tapered Roller Straight Roller • Ball • Needle Rollers

In order to determine if there was an incomplete oxidation of the carbon in the steel sample, experiments were carried out on burning the samples with and without tin as a flux. As shown in the table, there was no appreciable difference in the results obtained. If carbon is held in the iron oxide residue, it would be expected that there would be some difference of available carbon dioxide in this case because of the different oxide environment. Based on this and other tests, such as reducing the oxide and reburning the iron or grinding the oxide and reheating, the conclusion was reached that no carbon is left in the residue which results from the burning of low-carbon steels in oxygen. Any carbon found probably results from absorption of carbon dioxide from the atmosphere on oxide and ceramic.

Size of Sample—In connection with the relation of size of sample to carbon content an experiment was performed as described below: Bureau of Standards steel 8G (0.069 per cent carbon) was analyzed in samples varying from 0.005 to 1.1 grams. This gives a variation in carbon content from 0.003 to 0.70-milligram. As shown in Fig. 2, all results are in agreement, giving an average value of 0.0635 per cent. This is additional proof that the low-pressure combustion equipment can handle all ranges of carbon contents without appreciable loss or trend, depending on size of sample or carbon content.

The experimental program carried out by Uhlig and Naughton has succeeded in establishing three facts of importance to metallurgy:

(1) For low carbon steels, the usual method for carbon analyses gives high results; (2) the low-pressure combustion method is precise for either low or high carbon steels; (3) the Bureau of Standards' steel samples are very uniform and contain the stated carbon content even when weighed out in small quantities.

Permission of the American Chemical Society for publication of this resume is gratefully acknowledged.

Expansion of South Wales Plants

To Provide More Steel

FOUR important British companies have formed the Steel Co. of Wales, Ltd. to bring the output of steel, tin plate and related products in South Wales to a new high level. The four participating companies—Guest Keen and Baldwin's Iron and Steel Co., Richard Thomas and Baldwin's Llanelly Associated Tin Plate Companies and John Lysaghts—will develop the Port Talbot and Margam Works for additional steelmaking capacity. A new hot continuous strip mill as well as a cold reduction unit will be built for completion in 1951.

The Port Talbot Steel Works includes six 70-ton gas-fired open hearths at present. These will be increased to 80-ton Venturi oil-fired furnaces. Upon completion of the continuous strip mill the existing plate and slabbing mills will be abandoned.

At present, the Margam Works receives important iron ore from Newfoundland, Sweden, France and North Africa. The ore stockyard will be enlarged to hold 300,000 tons. Three ore bridge unloaders, claimed to be the first of their type in the British Isles equipped with Ward Leonard control, will be installed. Blending of the ore for the blast furnaces will be done from the stockhouse bin. A new coal handling plant and 90 new coke ovens now are under construction. Two of the three existing blast furnaces are to be rebuilt with hearths of 25 feet, 9 inches diameter. The open-hearth shop eventually will house six oil-fired Venturi furnaces.

When completed, the combined plant is expected to have an output of 19,000 tons of pig iron, 29,000 tons of steel and about 20,000 tons of strip and plate.

Buildings to house the soaking pits and slabbing mill at the Abbey works are beginning to take shape

Driverless Fork Truck Shown at Handling Show

Despite the fact that the driver's seat was empty, a fork truck exhibited by Automatic Transportation Co., Chicago, at the recent National Materials Handling Exposition in Philadelphia, performed all the customary functions of a lightweight materials handling machine. Operated by ray control—no further explanation of how the ray was used to drive the truck was given—the truck is a standard model of a new machine being shown for the first time.

Operator of the equipment was hidden behind a one-way glass screen and was able to see the entire floor before him. Using a panel of dials and buttons he guided the truck through all of its functions, including tiering as done in a warehouse or factory. It was further explained that radio was not used to control the truck, as radio frequencies for such a unit are unavailable.

—o—

One of the first books to appear in postwar Germany has just been published by Druckhaus Sachsenstrasse, Essen, Germany. It is entitled "The Marshall Plan" and discusses Germany's prospects and opportunities under the plan. Dr. Herbert Gross, Benrodestrasse 20, Dusseldorf-Benrath, British Zone, is the author.

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Timken steels are tailor made to meet your specifications for chemical and physical properties. For help with your problems, write us today. Ask for our 112-page book, "Evaluating the Forgeability of Steels". The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, O. Cable address: "TIMROSCO".

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Specialists in alloy steel—including hot rolled and cold finished alloy steel bars—a complete range of stainless, graphitic and standard tool analyses—and alloy and stainless seamless steel tubing.

Induction Heating—*Concluded from Page 64*

2. Lighter spur gears (7 pitch and lighter). Preheat to about 1000° F with 9600 cycles; heat teeth to hardening temperature with very short application of 250,000-cycle power (0.8-second maximum); quench in water spray; reheat with 9600 cycles to 350° F. This achieves a semicontour hardening with core hardness extending approximately up to the pitch line. This applies principally to transmission gears.

3. Spiral or helical gears. Heat for hardening temperatures with 9600 cycle, quench in high pressure oil in submerged spray (40-90 pounds per square inch).

4. Cylindrical surfaces (crankshafts, etc.). Heat with 9600 cycles to hardening temperature, water spray quench. Stationary heating with quench spray through the inductor or progressive heating in which work is fed through the heating coil into the spray quench.

5. Small sections or odd shapes. Heat with approximately 450,000 cycles to hardening temperature and water quench. This applies to very small gears, small wear surfaces, bearings on thin cylinders, or small diameter shafts etc. and usually achieves a relatively thin hardened area.

6. Splines.

a. Splines hardened for wear only. Heat with 450,000 cycles, water quench.

b. Splines hardened for torsional properties. Heat with 9600 cycles, static or progressive method, quench with high pressure oil spray.

In most cases generating equipment is separate from heating stations. Most of these high frequency generators are located overhead above the induction department. This power is carried down to the heating stations below. Fig. 3 shows part of a group of 12 stations powered from two generators with ingenious switching mechanisms which permit use of various stations together or alternately. Fig. 6 shows the highly specialized automatic gear hardening machine which applies the cycle shown above as "2" to as many as 800 gears per hour. Fig. 7 shows a two-station self-contained hardening machine using radio-frequency (450,000 cycles). Figs. 1 and 2 show the crankshaft hardening equipment in which seven bearing surfaces are hardened successively by automatic control.

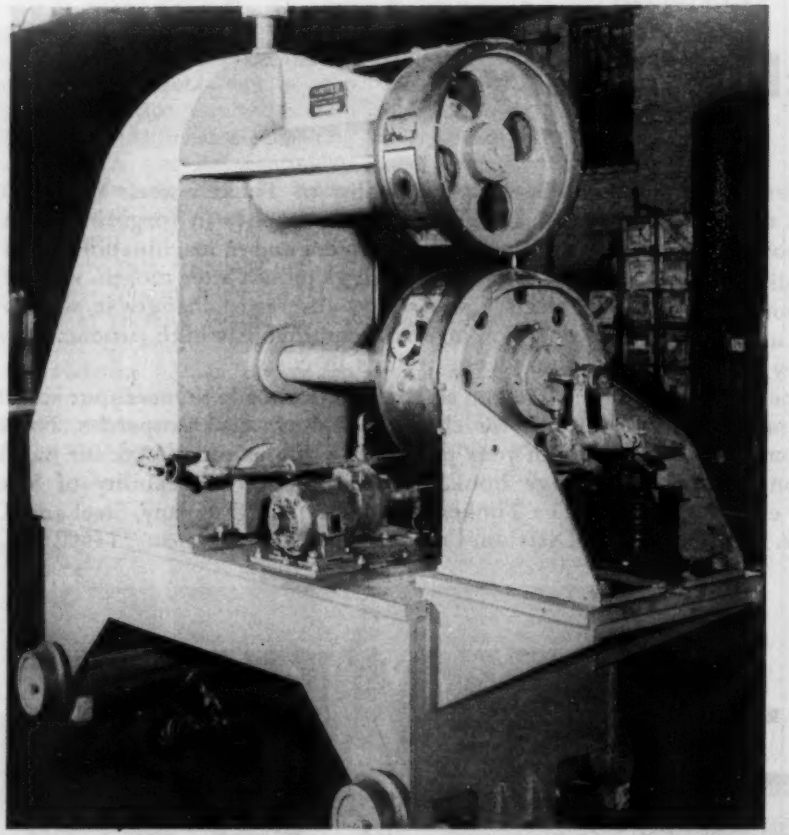
Principal economies result from the use of carbon steels in place of alloy steels, and the elimination of many machine operations resulting from distortion which accompanied previous heat treating methods. Also, in many cases heat treating costs are lower and quality greatly improved due to lack of distortion and better stress distribution.

Brazing and Soldering—All production brazing and soldering jobs are accomplished by induction heat. Fig. 5 shows an intricate tube and forging assembly being brazed in a 20 kilowatt 9600 cycle machine. Parts of the assembly are fluxed and put together with a small ring of silver solder in the joint. The assembly is heated in an induction coil and brazing takes place when the flow temperature of the silver solder is reached.

Induction heat produces uniformity of heating, localized heating and rigid heating, all of which contribute to increased quality and economy of the operation.

Shrinking — Several production shrinking jobs utilize induction heating. A total of 240 kilowatts is employed in this manner, heating ring gears with 60 cycle power, employing a movable split transformer core, using the gear to be heated as the short-circuited secondary of the transformer. This method is also used to preheat heavy gears as discussed previously.

Application of induction heating at the Louisville, Ky. plant of International Harvester has presented many new problems. An installation of this size necessarily requires specialized maintenance and rigid metallurgical control. Many applications involve substitution of higher carbon steels requiring careful attention to machining methods and in some cases loss in tool life and production. In general, however, the results of this wholesale application of induction heat have been very gratifying.



SAMPLE TAKER: Samples up to 4 inches in diameter are cut out of steel strip running at speeds up to 2000 feet a minute with this flying sample punch built by United Engineering & Foundry Co., Pittsburgh. The revolving drums, containing the punch and the die and shown with the guards removed, are in constant synchronization with the strip. Samples may to be taken at will to be used for rapid determination of physical properties and coating characteristics so that proper adjustments may quickly be made

Here's Why

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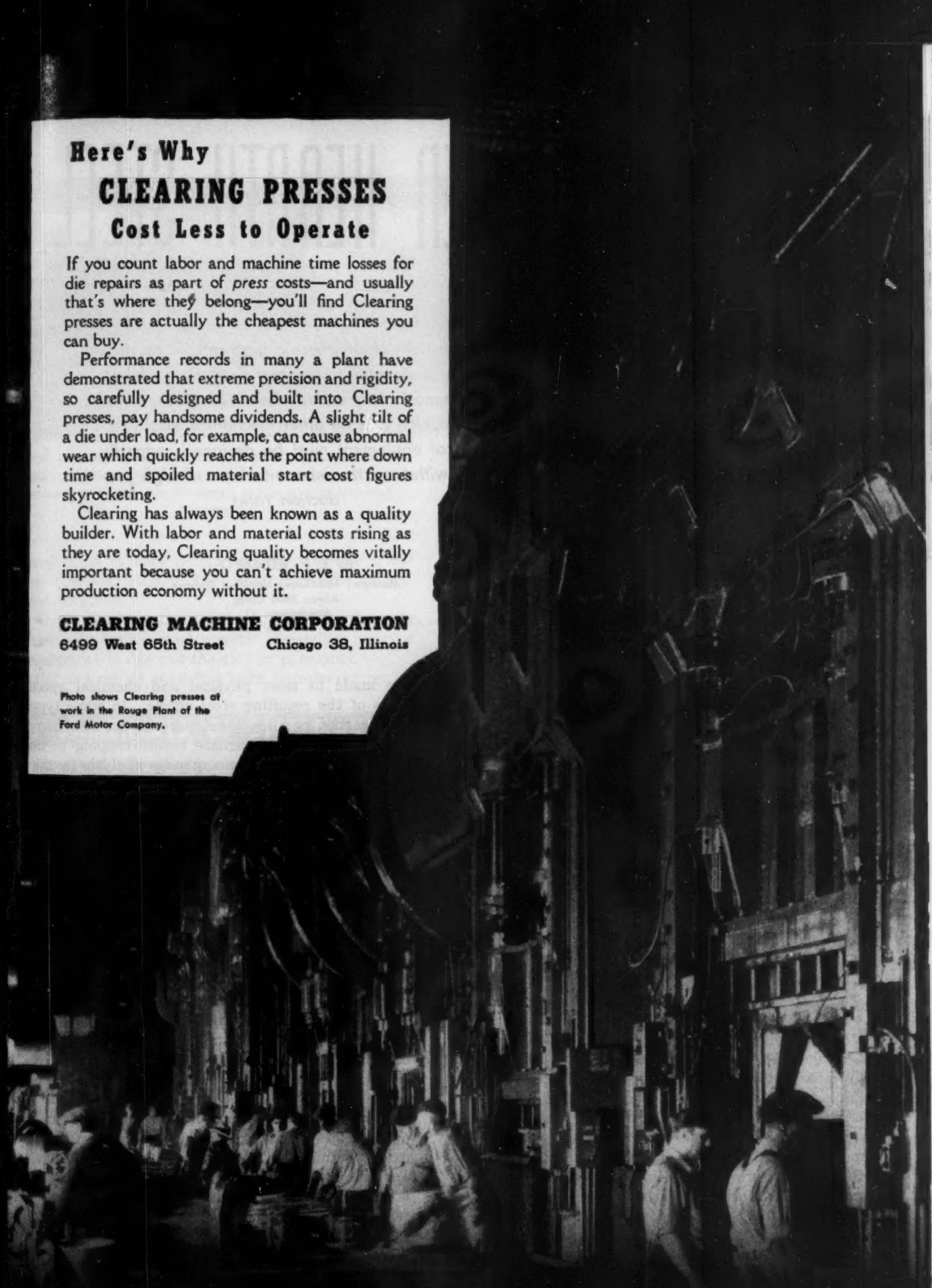
Photo shows Clearing presses at work in the Rouge Plant of the Ford Motor Company.



CLEARING PRESSES

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PRODUCTION OF OPEN HEARTH STEEL

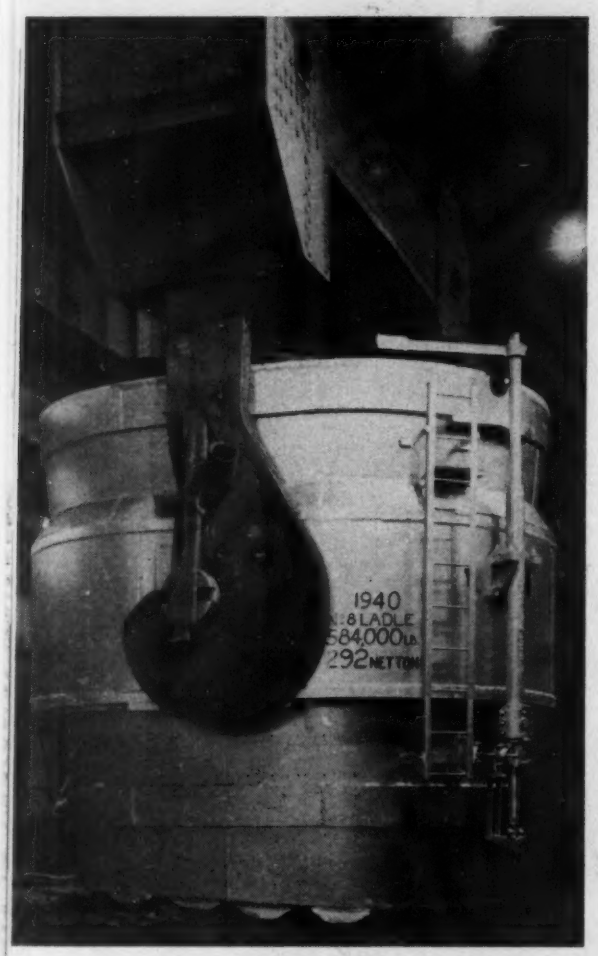

Fig. 24—Close up of 200-ton capacity welded steel ladle showing heavy ladle bails, safety check arm, safety ladder and stopper rod mechanism

In a steel plant where a high rate of production is essential to low-cost operations, delays are most costly experiences. Therefore, transportation and all other mechanical and electrical equipment must be designed ruggedly to withstand the inherent abuse of high production rates

By L. F. REINARTZ
Manager, Middletown-Hamilton Division
Armco Steel Corp.
Middletown, O.

PART III

OXYGEN is a great boon to the furnace man in helping speed up the tapping operation, and helps reduce the hazard of a hard tap hole. In former years hard tap holes had to be slowly and laboriously sledged open. Now in a few mintues frozen metal is melted out of the hole with an oxygen lance. The metal from the furnace runs quite rapidly through the tap hole into a brick-lined spout and then drops into a welded, brick-lined steel ladle, suspended from a 200 to 250 ton ladle crane. (See Fig. 24) During this operation crushed ferromanganese, ferrosilicon, ferrophosphorus, carbon in the form of coke or anthracite coal, aluminum, and other ingredients contained in bags may be thrown into the ladle—or they may, more preferably, from a uniformity standpoint, be added in regulated amounts into the spout or ladle by means of a hopper, operated by a long lever controlled by the furnace man. These ladle additions are made to meet physical and chemical specifications of the resulting steel ingots. In some types of high carbon or alloy steel, part of the ferromanganese is added in the furnace before tapping to insure greater uniformity of manganese analysis in the finished steel.

Slag, being lighter than molten metal, runs out of the furnace last. It is important to have the taphole small enough, and of proper length and shape, so that as little slag mixes with metal as possible during tapping operations. Ladles are designed, and charges made of such size that very little slag, say 4 to 8 inches, remains on top of the metal in the ladle when all the heat has run out of the furnace. This procedure is followed to improve ladle lining life (12 to 15 heats average) because low carbon slags cut brick work badly. Excess slag runs off through a spout on top of the ladle into a slag pot. Slag pots vary from 250 to 450 cubic feet capacity, depending on furnace size. Slag is allowed to cool, taken by train to a slag dump, broken up and, in many cases, some of it, in crushed form, is returned to the blast furnace department where it is charged with the iron ore and other materials to recover the iron from iron oxide contained in the slag. Low carbon slags will approximate 20 per cent of the weight of metal which is tapped from the furnace, and will average about 18 to 25 per cent FeO. Slag ladle and car shown in Fig. 25.

Normally, it requires from 2½ to 3½ hours to charge the scrap into a 150 to 200-ton open hearth furnace. Addition of hot metal may require another 1 to 2 hours. Heats are melted and ready to work in about 8 to 10 hours from time of charge. Total heat time, from charge to tap, will be from 10 to 12 hours with a production of 12 to 20 tons per hour,

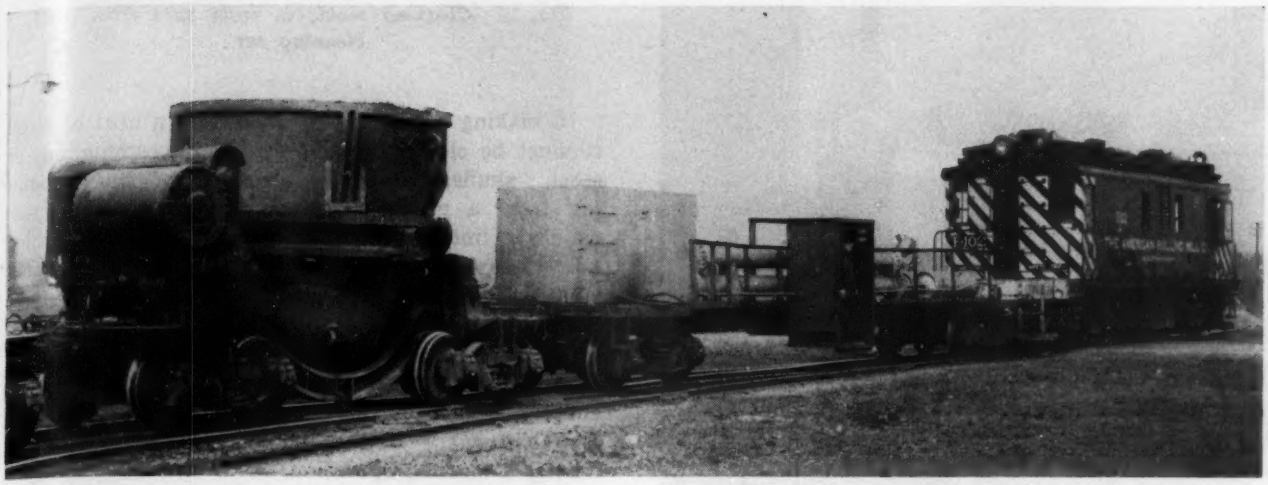

Fig. 25—Safety spacer car and 400 cubic foot slag ladle and car. Note large cylinder for storing compressed air used for dumping ladles and safety cab for men

depending on furnace design and size, amount of hot metal charged, kind of fuel used, and skill of personnel involved.

Open hearth pit operations may help improve or seriously injure steel quality, depending on type of equipment in use and the skill of personnel.

After a heat of steel has been transferred on ingot cars from the open hearth pit to the stripper crane, molds are stripped, that is, they are lifted from the ingots and set on another set of stools on ingot buggies on an adjacent track. (See Fig. 26) It is necessary to take this drag of empty mold buggies to a mold preparation yard where, from a repair platform, molds and stools are scraped, and all steel and iron oxide particles removed. Molds are then dipped in a bath of liquid tar, or a graphite mixture may be sprayed on inside walls of molds and on stools in order to prevent metal sticking when molten steel is poured into them. (See Fig. 27) Graphite coatings are preferable because noxious fumes are not created when steel is poured into molds. (See Fig. 28)

Molds are next raised with an unique automatic lifter by means of a crane to have any debris blown away from the stools with compressed air by the ground man. The drag is shifted into the open hearth pit to the pouring platform—ready for the next heat. (See Fig. 29)

FUNDAMENTALS OF STEELMAKING

NUMBER **3** OF SERIES

Another in a continuing series of articles on the making of steel and finishing it into products ready for the consumer. Each article is written by an outstanding authority in his particular field.

To assist in stripping molds from hot ingots, most molds are made larger on the inside bottom cross-section than at the top. They are equipped with lugs or "ears" on the outside of the top for stripping purposes. Some heats of alloy or high carbon steel must be poured into big-end up molds which are equipped with refractory hot tops or cast iron, brick lined, hot tops to decrease the internal shrinkage or pipe cavity, which is common to such steels if poured into a regular big-end down mold. Special handling equipment must be provided in the mold and stripper yards to handle such a practice expeditiously and to avoid stickers when stripping molds from ingots.

Solidifying ingots do not ordinarily stick to the molds because metal in the cast iron mold expands as it heats up, while ingot metal is contracting as it

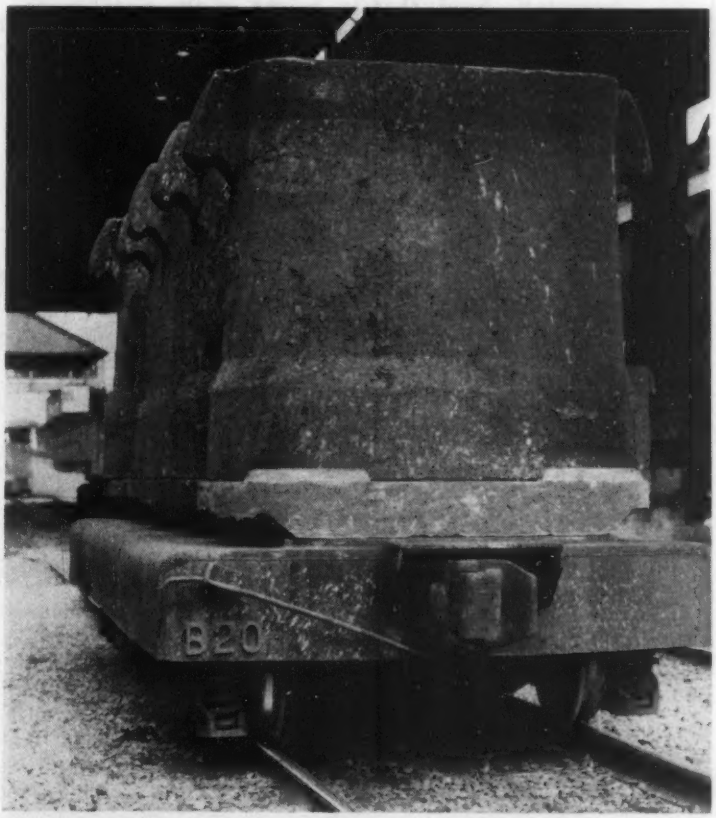

Fig. 26—Molds on stools on mold car. Lugs are for removing molds from ingots

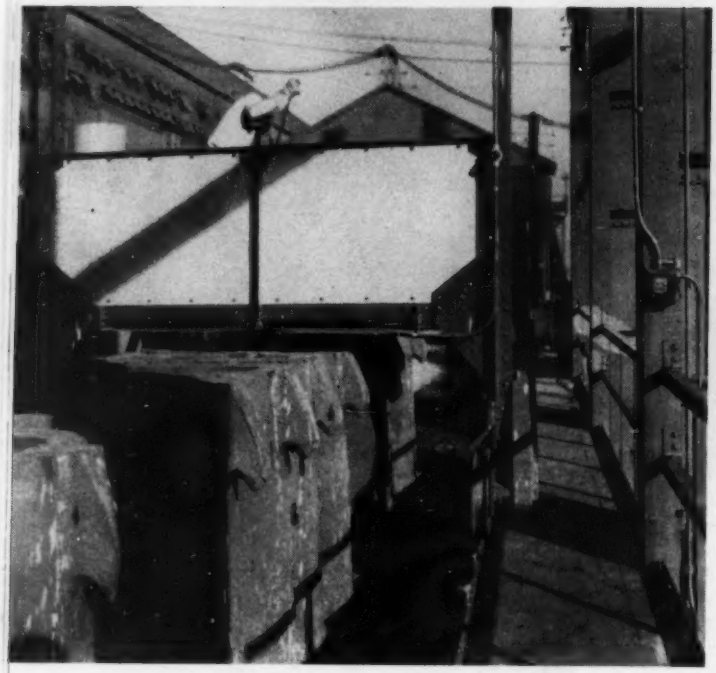

Fig. 27—Cleaning molds in mold yard from mold cleaning car

cools from the liquid state. In order to avoid ingots sticking in the molds after solidification, it is, however, necessary to cool molds to about 150 to 200° F before pouring again. Molds should be dried out if they become wet, in order to avoid explosions when teeming molten steel into them, and to avoid quality difficulties because of the violent reaction between moisture and molten steel.

Ladles may be round or oval. Modern tendency is to use oval ladles in order to expedite cleaning and removal of frozen steel, known as "skulls," after a heat has been poured, as well as to decrease the ferrostatic head, that is, height of the metal in the ladle. This latter advantage decreases pressure on stopper rods and thus helps eliminate loss of stopper heads while pouring steel. Many modern ladles are of an all welded construction to decrease weight.

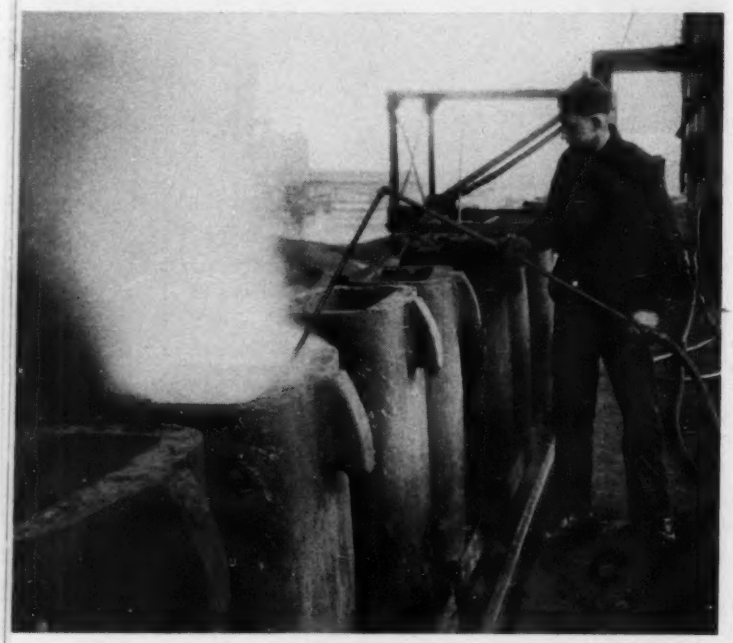

Fig. 28—Spraying graphite into mold in mold yard from cleaning platform

In making a ladle ready to receive a heat of steel, it must be cleaned so there are no accumulations of steel, "skulls," (particles of steel) or slag remaining from a previous heat. The steel stopper rod, which is lined with round brick sleeves, and which has a graphite head fastened to the lower end, must be carefully assembled, according to rigid specifications. It also must be slowly and thoroughly dried in a vertical heating oven before use. (See Fig. 30) Any deviation or carelessness in this operation will subsequently ruin even the best steel made in an open hearth furnace if the stopper rod assembly fails during a teeming operation.

Before the ladle is placed under the furnace spout, a stopper rod is placed into the ladle. The graphite head rests solidly on a brick nozzle in the ladle bottom near one side, away from where the stream of steel might strike it. The nozzle is carefully placed in the brick-lined ladle, and tamped into place by use of clay loam or fire clay between the nozzle and the ladle's brick bottom. Nozzles may have round or oval holes, which are from 1½ to 3 inches in diameter and about 12 inches long, depending on size and shape of molds to be poured and type of steel being made. Fit between the nozzle and stopper head must be perfect to avoid leakage. Sometimes nozzle cups are ground to assure a perfect fit with the stopper head.

Upper end of the stopper rod is fastened to a prong-shaped bent rod, known as a "goose-neck," which fastens into the stopper rod lifting and lowering mechanism on the outside of the ladle. From a safety standpoint, ladles must be thoroughly dried at a fairly high temperature, after being lined, and before steel is poured into them, to be sure no moisture from the lining operation remains. A ladle must normally be relined with brick after every 12 to 18 heats.

When a ladle is filled with molten metal, which practice takes from 8 to 12 minutes for a 150-ton heat, it is transferred to the pouring platform above the drag of molds. (See Fig. 31) The ladle man centers the bottom of the nozzle over the middle of the first mold, and opens the nozzle by lifting the stopper rod mechanism. Metal then flows through the nozzle into the mold. The ladle man controls speed of pour by size of the nozzle opening, and by use of the stopper rod lifting and lowering device.

He must avoid splash on the sides of the mold—by too fast or too slow a rate of teeming. "Killed," or steels which have no visible gas action in the molds, are usually poured more slowly than rimming or effervescing steels. These latter steels are usually ones containing from 0.01 to 0.20 per cent carbon, without an excess of deoxidizers, such as aluminum or silicon, having been added in the ladle. These steels are largely used in manufacture of plate and

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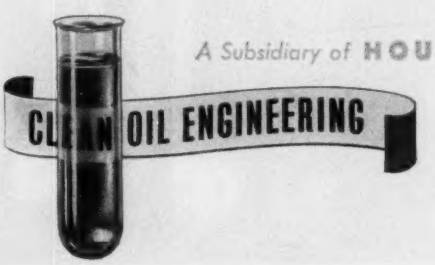

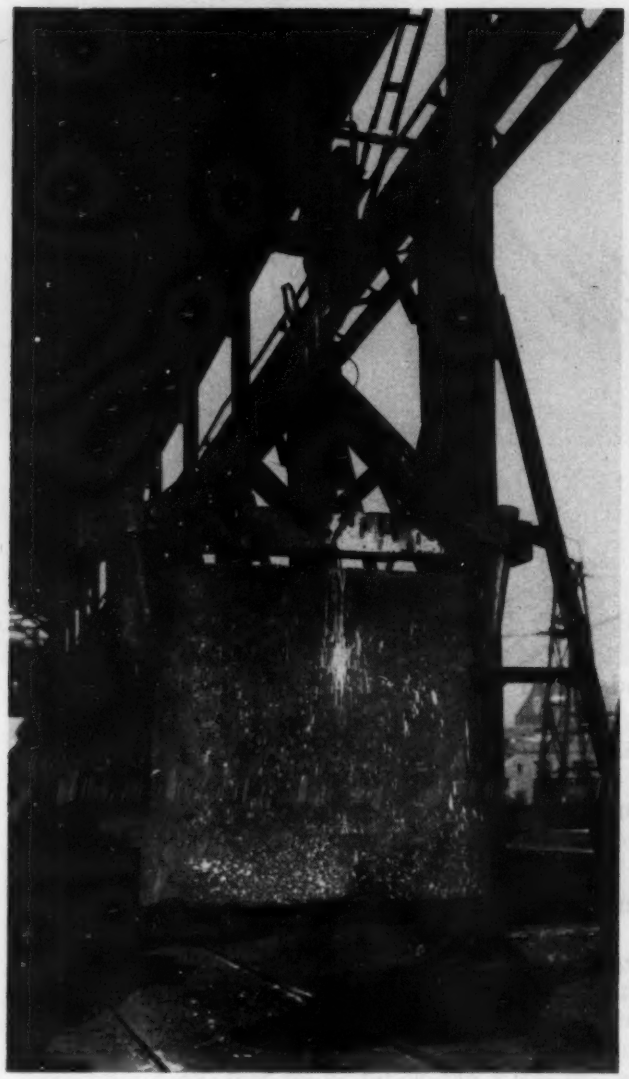

Fig. 29—Automatic lifting mechanism for handling large molds in mold yard by craneman

strip steels. Too fast teeming means poor internal structure in the ingot. Too slow teeming creates laps and folds on the ingot surface. Experience must determine the right teeming speed for each type of steel being made. Ground ferrosilicon, ferrotitanium, and other additons, may be made to molds as the steel is poured into them. Aluminum shot, about the size of peas, is added to rimming steels in small quantities to control the rate of gas evolution (reaction of iron oxide and carbon in the metal.) The more aluminum added, the less the reaction and gas evolution, because aluminum reacts with iron oxide and neutralizes its action with carbon in the metal. During the teeming operation several samples are taken, by means of a long handled spoon, from the stream of metal as it runs out of the nozzle. The metal is poured into a test box and, after solidification, sent to the chemical laboratory for analysis. This analysis will, from then on, represent that particular heat of steel. It is remarkable that a 3 to 4 pound sample from a 180 ton heat can be so representative of the entire melt.

Sodium and calcium fluorides may be added to metal in the mold to improve the evolution of gas from rimming steels, containing about 0.12 to 0.25 per cent carbon. Teeming steel is a hazardous operation. Ladle men must be equipped with blue glass goggles to protect their eyes against radiation from the molten steel and any metal splashes. They must wear hard hats, asbestos aprons and leggings, as well as safety shoes. Thus equipped, they can safely handle this important phase of steelmaking.

It requires approximately 25 to 30 minutes to teem a heat of steel containing about 180 tons into 25 to 30 molds. Molds vary in size. Some plants may have as many as 10 to 20 different sizes which must be changed as schedules in the slabbing or blooming mill change.

If a heat of rimming steel is being teemed, tops of the molten ingots boil very actively with the evolution of much gas and many sparks—a grand sight! The ingot starts to freeze from the edges towards

Fig. 30—Vertical stopper rod drying oven showing exit doors and completed rods hanging in furnace

ARC WELDING CUTS COST 43% ...builds a stronger product

By A. D. NEAL,
Works Manager
B. F. Avery & Co.
Louisville, Kentucky

To avoid structural failures caused by striking hidden stumps or stones has been a major problem in the development of farm tractors and implements. By converting to welded design on key parts like axles and wheels, manufacturing has been simplified and field breakdowns virutally eliminated.

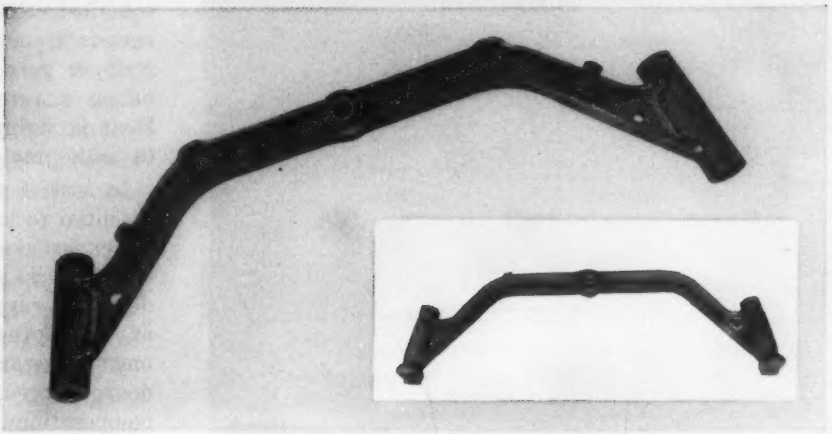

Fig. 1. *Weight reduced 30% . . . cost cut 43%.* Present design, all welded steel front axle. Has pressed steel channel frame and steel spindle housings. Inset shows former construction of cast steel.

IMPROVES DURABILITY

Experience shows that the welded designs have greater strength as well as exceptional resilience to severe mechanical shocks. Building the component parts from fabricated steel also eliminates the chance for any difficulties through inconsistencies in cast metals. Thus, with welded design, greater product dependability is achieved to meet unknown and abnormal operational needs.

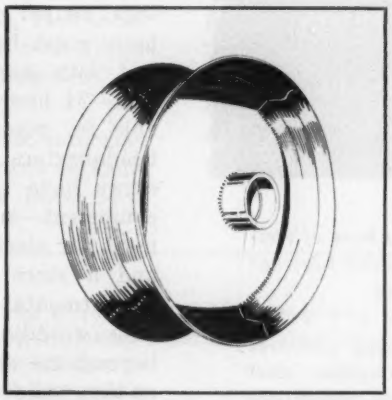

Fig. 2. *Stronger and more durable* all welded steel front wheel for farm tractor now used.

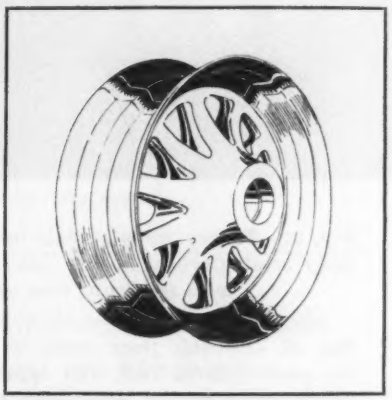

Fig. 3. *Former construction* had cast steel hub welded to rolled steel rim.

SIMPLIFIES MANUFACTURE

Substantial savings in manufacturing costs result in fabricating our tractor and implement parts with arc welding. Less material is required since components are stamped from steel plate or machined from bar stock with high speed equipment. Arc welding is done on simple, quick operating swing-type fixtures permitting fast downhand welding. On most jobs, no further machining is required after welding.

Fig. 4. *Cost cut 62% . . . weight down 69%.* Weld-fabricating a front tractor wheel. Component parts shown on table are located in simple fixture for welding.

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Machine Design Studies available to engineers and designers. Write The Lincoln Electric Company, Dept. 62, Cleveland 1, Ohio.

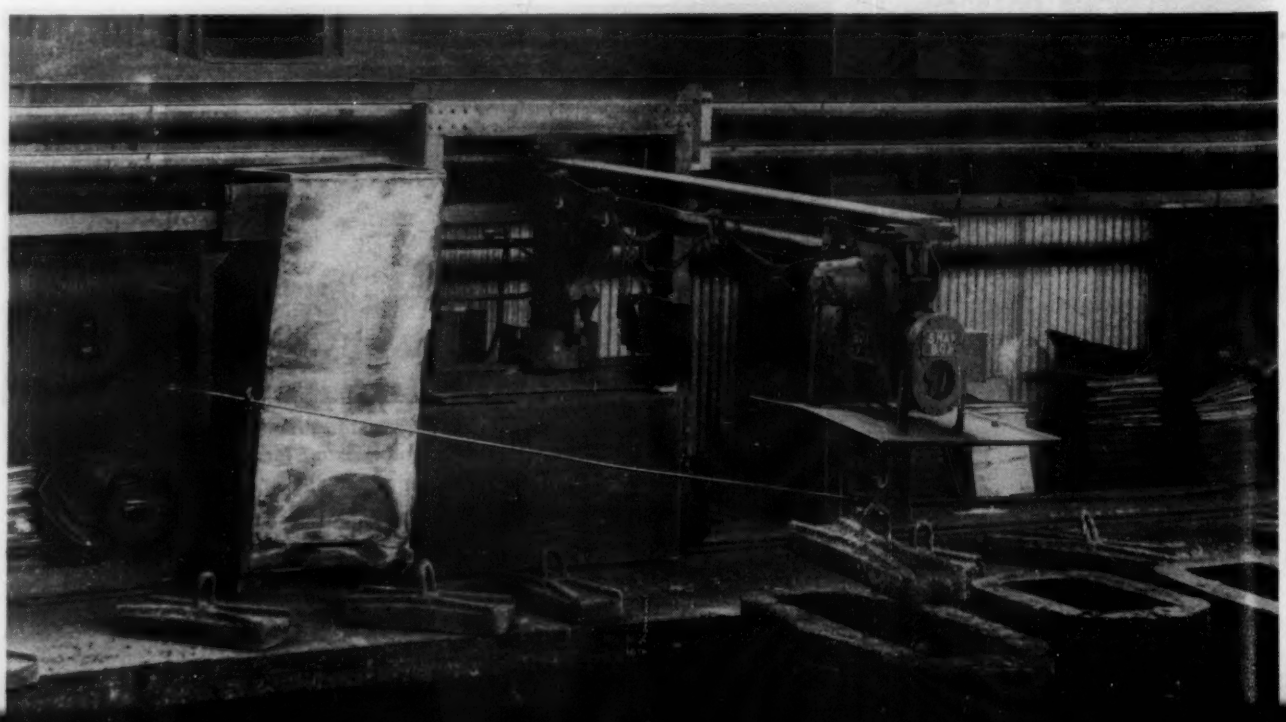
Fig. 31—Taking sample while teeming heat of rimming steel. Carbon dioxide gas is evolved together with sparks of iron particles

Fig. 32—Movable floor crane on pouring platform for placing large cast iron caps on rimming steel ingots after partial solidification. Also shown are plates to be placed in bottom of mold stools to increase their life

the center. When a square of open metal of about 6 x 6 inches cross-section remains, a very heavy cast iron cap, weighing up to 1000 pounds, if the ingot, weighs from 5 to 7 tons, is placed on top of the ingot, often by means of a special capping crane, to stop any further evolution of gas which would create a very uneven or "bull head" top if it were not capped. (See Fig. 32) When the top is completely solidified, the cap is removed. The train of mold cars is transported by means of a locomotive to the stripper yard, which may be in a separate building or on a runway adjacent to soaking pit furnaces. Heat is stripped, as needed by the pit operators, or to make molds available for another heat of steel.

In a steel plant where a high rate of production is essential to low-cost operations, delays are most costly experiences. Therefore, transportation and all other mechanical and electrical equipment must be designed ruggedly to withstand the inherent abuse of fast production rates. Maintenance operators must recognize this fact and must have, in a high degree, speed, intelligence, enthusiasm and a spirit of co-operation to help prevent delays and minimize their effect when they do occur. That means inspection of equipment must be carried on with a realization of the importance of this function; men must be trained to see and analyze situations quickly; strategic spares must almost instantly be available; repairs must be scheduled—and carried out carefully and with dispatch. In a seven day a week operation—24 hours a day—there is little time out available for repairs. An adequate maintenance repair headquarters should be provided where maintenance crews have available on the job certain tools and equipment—such as burning equipment, testing equipment for electrical work, drill presses, simple lathes, and a store room for constantly needed supplies. Departmental crews must be backed up by adequate help—readily available—from shop men when jobs beyond the ability of and the number of men arise, as they will from time to time.

Here again a high order of co-operation and skill is required to speedily repair sections of front and



back walls, ends and roofs of furnaces, which burn out as each furnace campaign progresses. The furnace men must schedule movement of cranes, transportation and other facilities in order not to hold up charging operations—but still also give service to the bricklaying crew—quite a problem at times. Major brick repairs to furnaces are usually scheduled ahead of time. Great numbers of maintenance men, bricklayers and laborers are required to do such a job, and all their efforts must be co-ordinated with each other and the operations of other furnaces in the department to return the furnace under repair back to the operating line in a minimum length of time.

Roofs may wear out or burn through in spots or may be damaged by scrap charged into the furnace by the charging machine operator.

In such instances, a "hot patch" is made by the bricklayers. This operation is a hot, difficult assignment. Considerable judgment, skill and ingenuity must, at times, be exercised to know how much of the roof to repair, and how to fit new brick in to the seasoned brick in the furnace roof. Roofs may have to be completely renewed every 150 to 250 heats. Brick work of a furnace may have to be repaired from floor level up every 300 to 400 heats (about every 5 to 6 months.) Furnaces must be rebuilt from slag pockets on up every two to three years, depending on types of steel made, fuel used, skill of personnel and other causes. At such times necessary repairs to worn or damaged sections of the steel work may be made.

During recent years, through exchange of information by operators at the national open hearth regional and national conferences, great strides have been made in improving the techniques of operation and equipment for fast repairs.

Fig. 33—Power conveyor for transporting brick from charging floor to top of open hearth furnaces

Ingenious devices have been developed for rapid teardown of furnaces; removal of slag from slag pockets—such as by use of dynamite, mechanical levers or bulldozers; gravity and power conveyors for moving brick to various parts of the furnace from the charging floor or open hearth pit; as well as suction and other devices for removing flue dust from checker chambers and flues to the stack. (See Fig. 33)

(*To be continued*)

Welder System Eliminates Radio Interference

By using what is termed a "balanced wave" combined with a new built-in control, the radio interference caused by inert-arc welders has been eliminated from all such welders built by General Electric Co., Schenectady, N. Y. Equipment formerly used for inert gas shielded arc welding emitted a high frequency radio signal which was a source of annoyance to radios and commerical radio services.

The continuous signal is eliminated, it is said, reducing the duration of the welder-caused radio noise to a fraction of a second—an interval comparable to the effect on radio reception to the flicking of a home light switch. The balanced wave is used to maintain a constant welding arc. It eliminates the continuous use of high frequency voltages by balancing the current with a bank of series capacitors so that pure alternating current flows between electrode and work. Welding arc is stabilized without use of radio-frequency energy, making filtering or shielding unnecessary.

Couplings Speed Changes Of Hydraulic Equipment

Hydraulically operated attachments and accessories on materials handling equipment can be interchanged or serviced in a short time with the application of self-sealing couplings being manufactured by Aeroquip Corp., Jackson, Mich. According to the company, they were designed specifically for use with hydraulic fluids. They allow fluid-carrying lines to be disconnected without draining the entire system or without the inclusion of air upon reconnection.

In actual practice, the coupling has been connected and disconnected in less than 30 seconds, it is stated. It is furnished with either a hex or wing-type coupling nut, either permitting the hydraulic lines to be connected without special tools, even when lines are pressurized.

Standard Recommends Gray for Machinery

Although not recommending that gray necessarily be used, a proposed standard for gray finishes for industrial apparatus and equipment does suggest that when such apparatus is painted gray the use of standard shades will help in matching the shade desired and in providing better color harmony. Four shades of gray are recommended in the proposed standard, now being circulated for comment and trial use by the American Standards Association, New York.

Grays are described according to number and Munsell notation. For additional convenience, color chips have been prepared. The standard provides for the use of the chips as secondary standards and recommends tolerances for both the secondary standards and the spectrophotometic work. Gloss and texture also are recommended in the standard, designated as Z55, available from the association.

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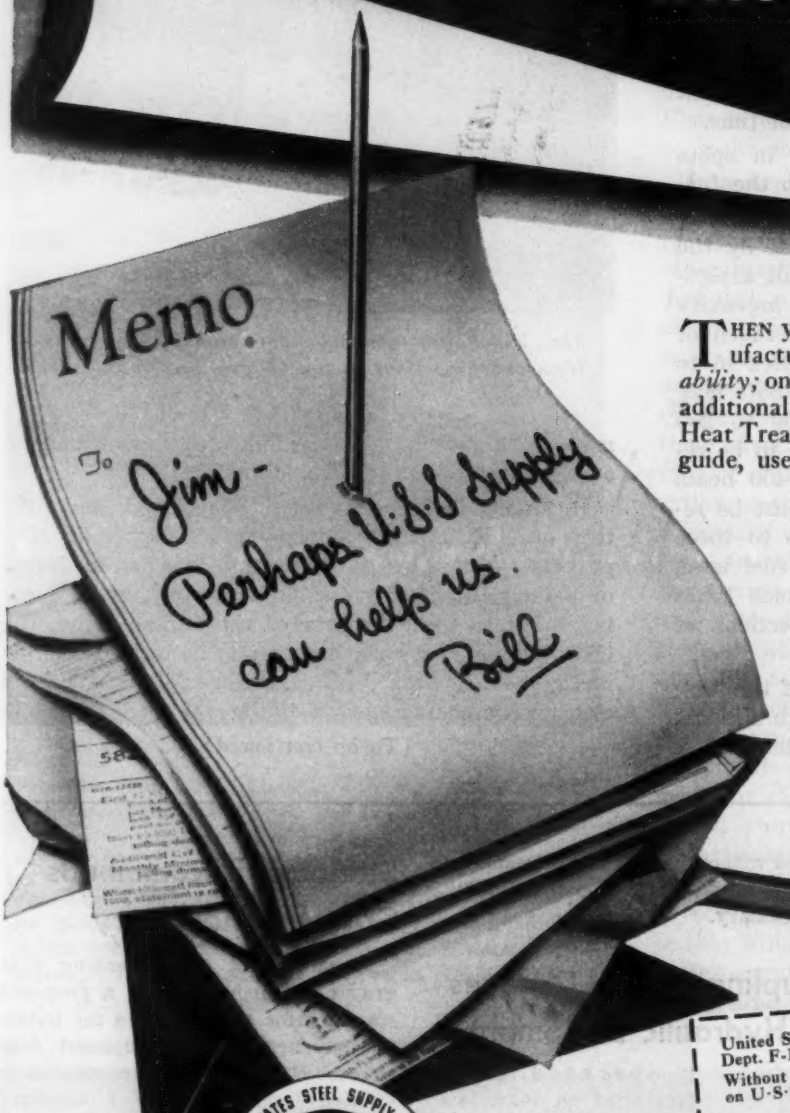

THEN you can rely on getting alloy steels manufactured to a *Guaranteed Minimum Hardenability;* on the prompt filling of your orders; and on additional metallurgical service in the form of a Heat Treatment Guide with each shipment. In this guide, users of U·S·S Carilloy Steels are given *specific* data on the composition, potential physical properties and recommended heat treatment temperatures to help them obtain the maximum performance from the steel we furnish on their orders.

Contact the U·S·S Supply warehouse or sales office nearest you for all your alloy steel requirements. We welcome your inquiries for literature. There's no obligation.

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The more scrap—the more steel

United States Steel Supply Company
Dept. F-19, 208 S. La Salle St., Chicago 4, Ill.
Without obligation on my part, please send us free booklets on U·S·S Carilloy Steels.

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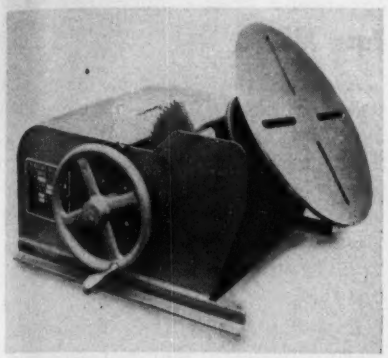
USS

UNITED STATES STEEL

New Products and Equipment

Work Positioner

A load capacity of 100 pounds is claimed for the motor operated work positioner announced by Ransome Machinery Corp., Dunellen, N. J., Driven by a hydraulic variable speed transmission and a ½-horsepower single phase alternating current motor,



the positioner permits all welds to be made in the downhand position.

Table top of the model I-P rotates 360 degrees at variable speeds, adjustable from 0 to 5 revolutions per minute in either diection. It can be manually tilted through 135 degrees and locks at any degree of tilt by means of a worm and segment.

Check No. 1 on Reply Card for more Details

Miniature Relays

Automatic and remote control circuit applications where space is extremely limited are the uses for which Bulletin 102 miniature magnetic relays, made by Ward Leonard Electric Co., Mt. Vernon, N. Y., are intended. Measuring 1⅛ inches high, 1⅝ inches long and 1 inch wide, the relays have a metal base and solder type terminals.

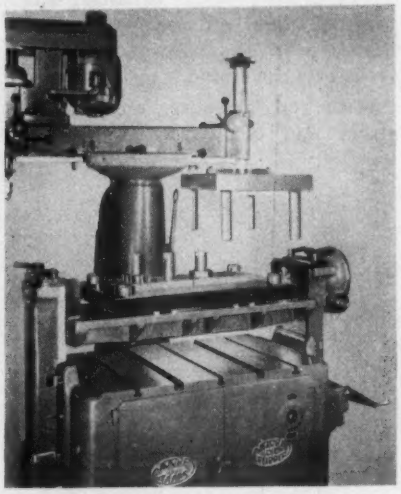
They are suitable for operation directly on 115 volt alternating current of 60 cycles or on 32 volt direct current circuits. Silver contacts are rated at 3 amperes, 115 volts, 60 cycles maximum for noninductive loads and are self-cleaning and self-aligning.

Check No. 2 on Reply Card for more Details

Die Handler

A die set 20 x 40 inches with a 12-inch shut height and pins engaged in bushings 4 inches can be taken apart and tuned over with the Die Flipper, an improved model of which is being introduced by Moore Special Tool Co. Inc., Bridgeport, Conn. In addition, one diemaker can drill, tap and try out, the punch holder and die shoe always being clamped securely to the machine.

Addition of a rear lifting device makes possible the mechanical removal of the entire die bed or punch holder and the placing of either member on a rolling truck while work is being conducted on the other. Machine also makes possible the counterboring for heads of screws tapped into

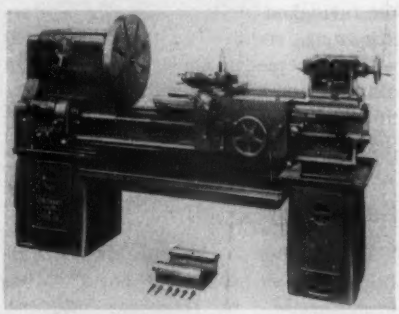


the punch flange, a ¾-inch drill chuck with long shank being available for this purpose. Radial drill capacity is 1-1/2 inches and speeds are from 200 to 1200 revolutions per minute. Also added to equipment available is a set of 10 Lassy tap holders and three Lassy tap spindles.

Check No. 3 on Reply Card for more Details

Tray Top Lathe

Tray top light duty fixed gap bed Cintilathe, offered by Cincinnati Lathe & Tool Co., Cincinnati 9, O., is available in 15 and 18-inch nominal swing sizes, with distances between



centers from 18 inches up in increments of 6 inches. Motors supplied are of 2 and 3 horsepower, respectively. Carriage is provided with short wings on the headstock end and wings on tailstock are extended to provide adequate bearing surface on the bed as well as the necessary rigidity of the entire carriage unit.

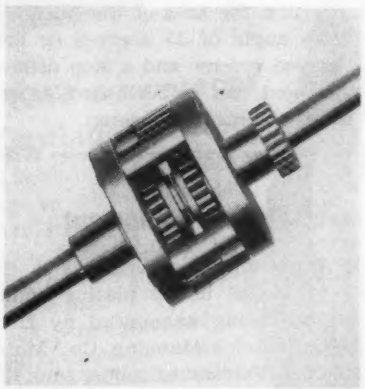
Capacity of the 15 and 18-inch swing machines is as follows: Swing over gap, 22 and 25 inches, respectively; approximate distance from end of spindle nose to end of gap, 9 and 10 inches; swing over bed, 15¼ and 18¼ inches; swing over compound, 9⅛ and 11⅞ inches; gap face plate available, 21 and 24 inches in diameter.

Check No. 4 on Reply Card for more Details

Mechanical Differential

Small mechanical differentials meeting the need for an accurate control device for such applications as measuring and controlling relative speeds, speed sums and speed differences, obtaining speed ratios between shafts, indicating and controlling torque and speed direction, etc., are being produced by Milwaukee Lock & Mfg. Co., 5074 North 37th St., Milwaukee 9, Wis.

Differential is of the spur gear type



and is available in either the open style (illustrated) or in the jacketed style which is grease lubricated. Facilities are available to produce these small units in a wide range of sizes and with special constructions as associated gears and gear trains, etc., to meet the varied needs of industry.

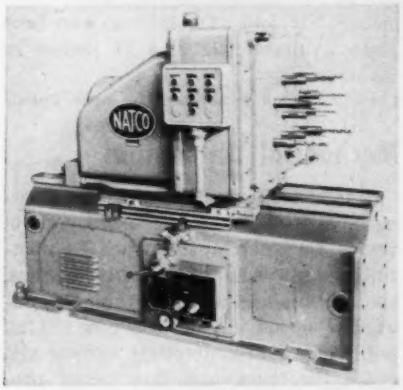
Check No. 5 on Reply Card for more Details

Drilling Units

Designed for incorporation in the construction of way type machines for drilling, boring and tapping and similar operations, are the model C2FT, C3FT (illustrated) and C4FT Holesteel floor type units, made by National Automatic Tool Co., Richmond, Ind. Dependent upon the application and production requirements, the units are arranged with standard sin-

gle spindle heads, fixed center multi-spindle heads or adjustable multiple spindle heads with either standard adjustable spindles or slip spindle plates and spindles. An electrically controlled hydraulic feed system provides an infinitely variable feed selection with specified range.

Bed is a cabinet type heavy box structure which prevents deflection under heavy thrust loads. Ways are of close grained high tensile cast iron. Head slide for mounting spindle head



is guided on automatically lubricated bed ways and is provided with gib adjustment. Antifriction mounted spindle may be located in any position within the area of the head and a drive angle of 35 degrees or less. A delayed reverse and a step drilling attachment can be furnished, as can a remote control for setup.

Check No. 6 on Reply Card for more Details

Barrel Plating Equipment

Changes and improvements in the line of Mercil barrel plating equipment are being announced by Hanson-Van Winkle-Munning Co., Matawan, N. J. Vulcanized rubber tank linings are again being used instead of sprayed rubber, used when the rubber supply was short. Changes in tanks includes two overflow outlets in rinsing units, dam overflow in each corner depressed 3 inches to facilitate rinse water disposal, tank width increased and hangers in rubber-lined tanks equipped with stop collars.

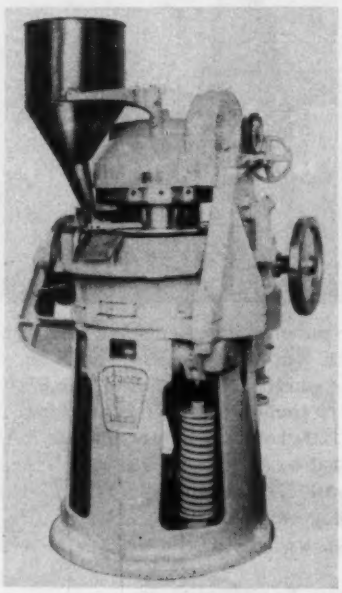
Single and double flexible dangler contacts are used on certain classes of work with reduced plating time and increased deposit thickness. All rubber cylinders are again furnished with green rubber parts. Monel cylinders are now furnished with Monel shafts, hanger arms and gears, this material standing up well in contact with acid solutions. Oblique plating barrel changes include roller bearings instead of bushing on the drive shaft, gear housing redesigned to eliminate two gears and an idler shaft, vulcanized instead of sprayed rubber cylinder covering and a stronger channel base.

Check No. 7 on Reply Card for more Details

Cold Molding Press

High speed cold molding of a wide variety of parts is possible with the fully automatic, 15-ton capacity, rotary type press made by F. J. Stokes Machine Co., 5900 Tabor Rd., Philadelphia 20, Pa. The press is equipped with an automatic safety release and a pressure equalizer which prevents jamming and undue strain on the machine and punches in the event of an overload.

With full pressure, applied from above and below, all cold molded



parts are of high and uniform density. Shouldered, flanged and other parts requiring different levels of compression are produced at high speed with minimum operator attention. A core rod attachment can be furnished where holes or perforations are required in the part. Press will take pieces up to a maximum diameter of 1 7/16 inches and a maximum die fill of 2 1/16 inches.

Check No. 8 on Reply Card for more Details

Hand Valves

In addition to the regular horizontal lever, variations of hand valves manufactured by Numatics, Milford, Mich., include: Upight lever for steel mill use, manipulators, crane control or other places where an upright control conforms to other controls; double chain lever for hoist control, door actions or installations requiring overhead mounting; and V-cam or dog trip lever, for automatic reversing or reciprocating actuating.

Valves have combination side and bottom port base to give mounting options. They are offered in both locking and nonlocking action, have soft lever action, 40-degree total movement, shielded lever mechanism and are noncorrosive. The valves can be permanently installed without pipe headers or mounting brackets.

Check No. 9 on Reply Card for more Details

Face Mill

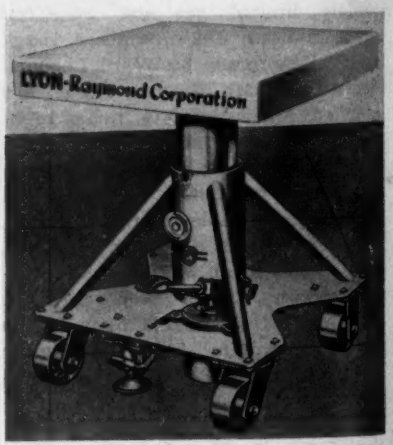
Added to the line of E-Con-O-Mill standard face mills made by Gairing Tool Co., Detroit, Mich., is a heavy duty model designed for roughing operations where the greatest wear occurs along the periphery of the tool. Blades are set at an angle to allow greatest adjustment in a radial direction.

Extra heavy cutter bodies are made 8 inches in diameter and over. All sizes are equipped with the same size of tungsten carbide tipped blades. These are of three types, for cutting steel, cast iron and nonferrous material. They come finish ground, ready to use.

Check No. 10 on Reply Card for more Details

Elevating Table

A 30 x 30 inch top which revolves fully or can be locked in a fixed position features the 4000-pound capacity hydraulic elevating table now



being produced by Lyon-Raymond Corp., 6838 Madison St., Greene, N. Y. The top has a 14 inch range of elevation, the lowered height being 28 inches and the elevated height being 42 inches. Portability under full load is provided by two heavy duty ball bearing swivel casters and two heavy duty rigid casters with 6-inch wheels.

8 MODERN FOUNDRIES

(Coast-to-Coast Service)

PLUS The 1949 advantages of Aluminum Castings by Alcoa

Compare the cost of finished products when you think of castings by Alcoa! Held to close tolerances, they require minimum finishing from as-cast. And their light weight means lower handling costs through your production line.

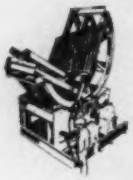
Alcoa produces sand, permanent, and semi-permanent mold castings. For more information and a prompt quotation, call your nearby Alcoa sales office (branches in 55 cities) or write ALUMINUM COMPANY OF AMERICA, 2112 Gulf Bldg., Pittsburgh 19, Pa.

Sand and Permanent-mold Foundries at Bridgeport, Conn., Cleveland, Detroit, Los Angeles

ALUMINUM CASTINGS by ALCOA

ALCOA ALUMINUM

. . . ever sit in on a Conveyer Post Mortem?



. . . they're mighty interesting, and more common than you might think. Just like other machinery that goes into heavy industry, conveyers sometimes break up under severe service. When that happens, there comes a series of shirt-sleeve sessions aimed at determining just why the job went bad. Sometimes it proves to be materials that are at fault; again, careless operators might be to blame; but much more often it develops that the equipment, for one reason or another, just wasn't designed heavy enough in the first place. But whatever they might prove—these long reviews of the details of a bad job—they are all part of the experience of seasoned conveyer people.

Most steel plant engineers find that it is pretty sound judgment to depend on conveyer people who have many years of such experience behind them—people who started years ago handling "heavy" coils which weighed 8,000 lbs., and who today are building equipment to handle those which weigh 25 tons—people who know why the good systems stayed on the job, and why the bad ones couldn't stand the gaff.

Give your heavy handling problem the attention it deserves. Take it to Mathews' Engineers, and let them go the limit in building into the job the weight required. It will pay off in long, trouble-free service.

MATHEWS CONVEYERS

GENERAL OFFICES . . . . . *Mathews Conveyer Company*
ELLWOOD CITY, PENNSYLVANIA

PACIFIC COAST DIVISION . . *Mathews Conveyer Company West Coast*
SAN CARLOS, CALIFORNIA

CANADIAN DIVISION . . . . . *Mathews Conveyer Company, Ltd.*
PORT HOPE, ONTARIO

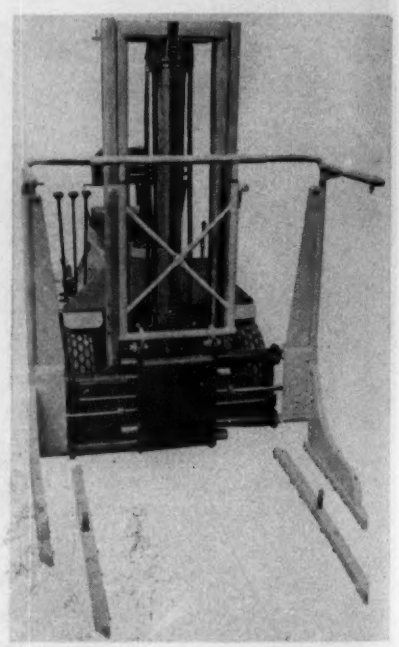
Engineering Offices or Sales Agencies in Principal American and Canadian Cities

Operation is by a single speed hydraulic foot pump developing 1000 pounds per square inch pressure. A pedal release valve controls the lowering speed. Table is suited for die handling and being portable, can be used to transfer dies between storage racks and presses.

Check No. 11 on Reply Card for more Details

Lift Truck Attachment

Hyster Co., Portland 8, Ore., has developed a Load-Grab attachment known as a box clamp for use with the company's model 20 lift truck. Adaptable to the standard hydraulic-controlled Load-Grab as optional equipment, it includes box clamp arms for grasping the load, sliding side support assemblies which may be adjusted to fit boxes of varying size and an overhead stabilizer bar to insure accurate stacking and to keep the load from shifting or separating.

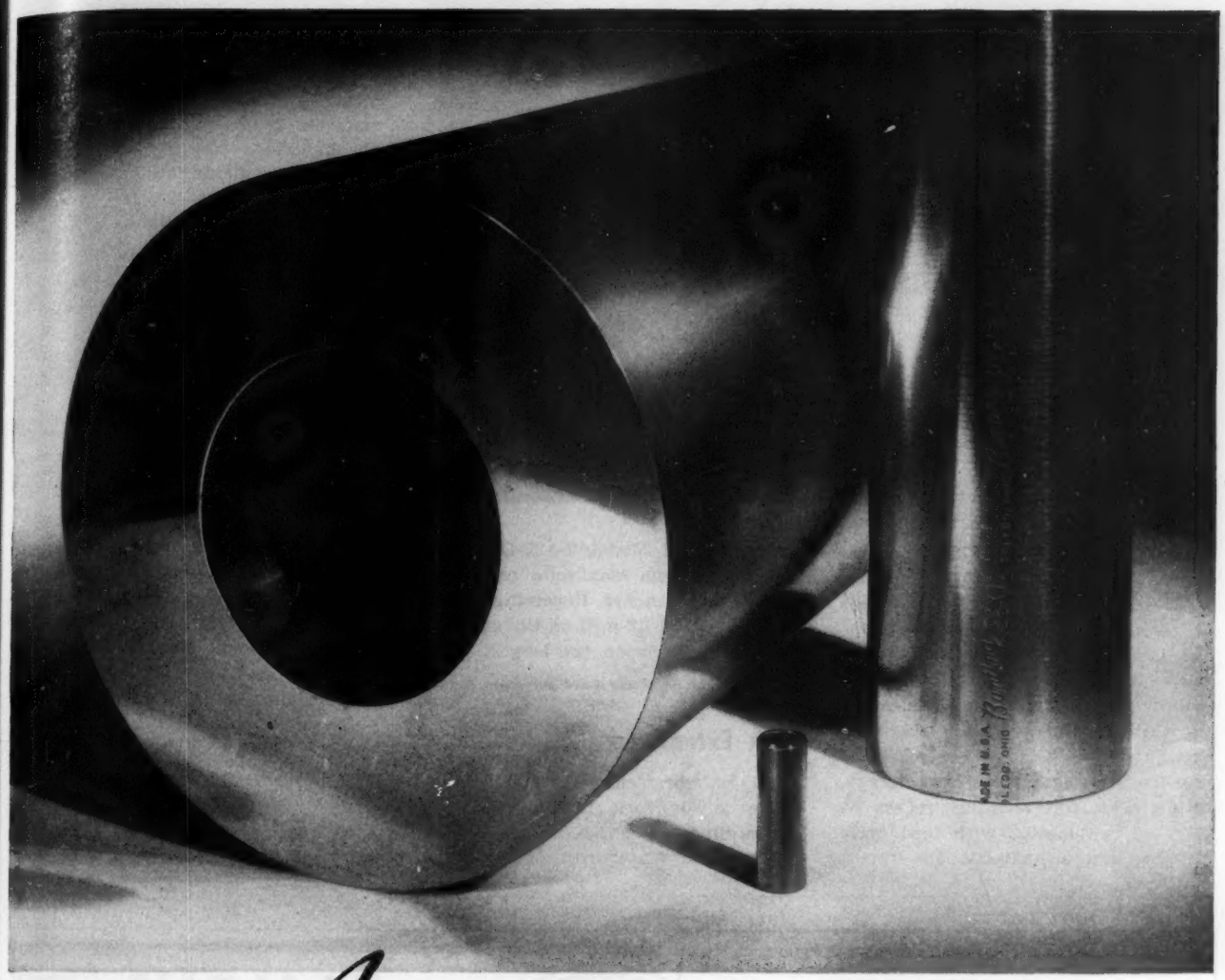


Box clamp arms are regularly 27 inches long, but may be ordered in 42-inch lengths. Loads up to 1780 pounds may be carried and the clamp arms will spread from a minimum of 25 inches to a maximum of 62 inches. They may be lowered to ground level.

Check No. 12 on Reply Card for more Details

Ball Bushings

Advantages of low friction, elimination of binding and chatter, lasting alignment and solution of lubricating problems are incorporated in the series B commerical grade ball bushings produced by Thomson Industries Inc., Manhasset, N. Y. Providing a support for lineal motions, the bear-



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Bunting

37

BRONZE BEARINGS ☆ BUSHINGS ☆ PRECISION BRONZE BARS

ings also impart long life and low maintenance expense to linear moving mechanisms.

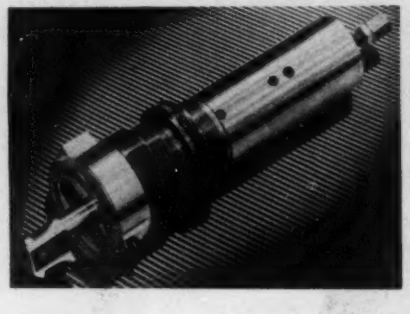
Ball bushings employ the principle of ball recirculation, thus enabling unlimited frictionless linear travel. Use of the units frequently allows designers to scale down size of an entire mechanism as the free rolling antifriction characteristics permit lower length to diameter ratios because of cocking and binding considerations. Ball bushings are being made in four shaft diameters of ¼, ½, ¾ and 1 inch. Additional sizes will be made.

Check No. 13 on Reply Card for more Details

Recessing Tools

Development of a line of recessing tools designed for use on multiple spindle automatics is announced by Maxwell Co., 570 Broadway, Bedford, O. Tools, known as Recess-O-Matic, can be attached quickly and utilize a telescoping draw bar for actuation, this connecting to the back of the machine. Work set-up requires no cam change. Adjustment for locating recess is made in conjunction with feed cycle of cam and adjustment for recess diameter is made on the tool itself by a microadjusting nut.

Actuating mechanism of tool reduced machine feed is a ratio of 2.75:1 to recess cutter. Working mechanism is protected against chip and turnings and wear surfaces are



hard chromed. Models 1-1/2-DB, 2-DB and 3-DB have maximum capacities of 2, 3 and 4 inches. Recessing stroke ranges from 9/32-inch on the smallest tool to 1/2-inch on the largest.

Check No. 14 on Reply Card for more Details

Fork Extensions

Slip-on fork extensions for Standrive power fork trucks made by Lewis-Shepard Products Inc., 271 Walnut St., Watertown, Mass., make it possible for the trucks to handle loads of different lengths efficiently with the same truck. The welded steel extensions are available with ends of various styles: Tapered ends for handling rolls of paper; standard ends for picking up pallets; chisel ends for handling bagged or other loose material; and others.

Attachment is by slipping extensions over the regular forks and locking them securely at the heel of the fork by means of a stud and latch. There is no side play, no forward and backward movement and no possibility of raising off the fork.

Check No. 15 on Reply Card for more Details

Temperature Recorder

As many as 160 separate thermocouple temperatures in succession at a rate of 4 seconds per point may be automatically logged with the Speedomax instrument developed by Leeds & Northrup Co., 4934 Stenton Ave., Philadelphia 44, Pa. Because each point is checked at such frequent intervals, high or low temperatures which may develop can be spotted readily before serious trouble results.

In case of trouble, the operator can cut thermocouples out of the

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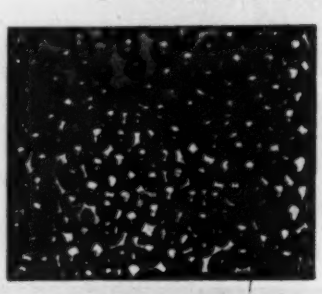
HI-GRADE METALLIC

FAMOUS
FOR ITS ABILITY TO STAND UP UNDER REPEATED HARD USE

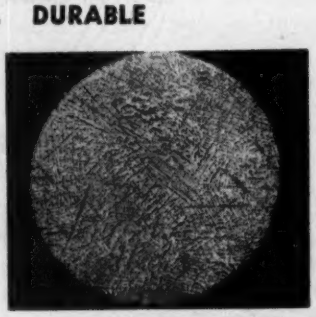
SHOT
- ROUND
- UNIFORM IN SIZE
- UNIFORM IN HARDNESS
- LACKS IRREGULAR SHAPES

GRIT
- RECTANGULAR
- SHARP
- TOUGH
- DURABLE



UNRETOUCHED PHOTO OF HI-GRADE SHOT

CLAYTON-SHERMAN ABRASIVES COMPANY
3896 LONYO ROAD
DETROIT 10, MICHIGAN
CEdar 7200



MICROSCOPIC STRUCTURE OF METAL

There Go 3269 Fasteners!

Tonight's test is tough . . . Doc Smith must get through . . . he's depending on the miracle of American mass production and (unknowingly) on the 3269 fasteners that give his car strength and stamina.

Over 500 screws . . . 331 nuts . . . 400 bolts . . . hundreds of rivets . . . furnish the forces that lock automobile assemblies together.

With this responsibility that fasteners must carry, it is obvious that quality is essential. That's why Russell, Burdsall & Ward makes the huge investment it does—in wire drawing mills of its own, in wire preparation, in laboratory equipment for extensive research, in advanced designs of equipment—all of which contribute to quality control.

Fastener *quality* and production savings go hand in hand. It isn't the initial price but the cost of *using* fasteners that counts. True Fastener *Economy* lies in *saving* assembly time, *reducing* the need for plant inspection, *getting* maximum holding power per dollar of fastener cost.

True Fastener Economy contributes to the kind of production savings that puts millions of new cars in U. S. driveways every year. It is this type of contribution to major American industries that explains why—for over 104 years—RB&W has been *making strong the things that make America strong.*

RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY

RB&W

Plants at: Port Chester, N.Y., Coraopolis, Pa., Rock Falls, Ill., Los Angeles, Calif. Additional sales offices at: Philadelphia, Detroit, Chicago, Chattanooga, Oakland, Portland, Seattle. Distributors from coast to coast.

3269 Fasteners are used in 1 small American car

104 YEARS MAKING STRONG THE THINGS THAT MAKE AMERICA STRONG

measuring sequence in banks of 20 at a time, until the instrument is concentrated on the particular group of temperatures in which he is interested. He can set the instrument to record any single thermocouple or to record all points continuously. Equipment consists of two parts, a recorder and a switch assembly, housed in separate cases. Recording starts when any temperature reaches a preset limit and an alarm is sounded.

Check No. 16 on Reply Card for more Details

Crane Cab Cooler

Lintern Corp., Berea, O., in announcing its improved crane cab conditioning equipment states that, in the new development, the condenser unit is located at any convenient place on the crane and the

evaporator, or cooling blast coil, is placed in the cab. The two units are connected with refrigerant lines properly secured and protected against line breakage by vibrator eliminators. Advantages of the Aire-Rectifier unit are decreased engineering costs, high cooling efficiency in the cab, elimination of air ducts and greater ease and flexibility of installation.

Condenser unit has not been changed. The air filter unit includes screen type and activated carbon filters and an electric heater for winter use. Evaporator or blast coil unit is located inside the cab and is suitable for either wall or floor mounting or for attachment to the air filter. Evaporator has all-copper cooling coil and a slow speed fan.

Check No. 17 on Reply Card for more Details

• • •

SANDING WHEEL: Model 300 D sanding wheel, made by Merit Products Inc., Los Angeles 27, Calif., consists of an aluminum body which houses a cartridge of abrasive cloth containing six strands fastened to a single core. Shank is bored to fit either a ½ or ⅝-inch shaft.

Check No. 18 on Reply Card for more Details

MAGNIFIER: Developed for magnifying the hard-to-read Vernier scales on calipers and height gages, Stebar Co., Minneapolis 8, Minn., offers a new Magna eye. It is made in three sizes to fit most popular and widely used Brown & Sharpe and Starrett calipers and height gages.

Check No. 19 on Reply Card for more Details

DETERGENT: Known as Drex-Foam, a detergent that quickly and thoroughly cleans dirt, grease and grime from automobiles, trucks, tractors, trailers, etc., is offered by Automotive and Aviation Service Division of Detrex Corp., Detroit 32, Mich.

Check No. 20 on Reply Card for more Details

PHOTO-COPYING UNIT: A photo-copying unit that can handle auto-positive paper efficiently, direct reproduction without negatives, reproducing accurate, uniform copies of printed or written matter is available from General Photo Products Co., Chatham, N. J. It is made in three sizes.

Check No. 21 on Reply Card for more Details

TUBE FITTING: A self-flaring, leak-proof tube fitting that can be taken apart and reconnected many times without weakening the seal or damaging the flare is offered by Scovill Mfg. Co., Waterbury 91, Conn. Known as Uniflare, it has only two parts.

Check No. 22 on Reply Card for more Details

LOW PRESSURE CLAMP: A low pressure clamp for use with flexible conduits is announced by Flexible Tubing Corp., Branford, Conn. Designated as Flexfast, it provides fast and positive clamping action over diameters from 1½ to 37 inches, each size having a wide range of take-up.

Check No. 23 on Reply Card for more Details

LIGHTING FIXTURE: A slimline fluorescent lighting fixture designed for commercial use and particularly suitable for buildings which have moderately high ceilings, has been announced by Sylvania Electric Products Inc. Designated as CSL-496, it is an unshielded unit utilizing four T8 fluorescent lamps having a total power of 204 watts.

Check No. 24 on Reply Card for more Details

ACID PUMP: An improved foot or hand actuated pneumatic pump for the safe and convenient transfer of acids and other liquids from carboys, barrels or drums is available from General Scientific Equipment Co., Philadelphia 32, Pa. Liquids flow smoothly, stop instantly and come in contact only with corrosion resistant tube.

Check No. 25 on Reply Card for more Details

TUBE CUTTER: Designed for use with copper, brass, aluminum, Bundy steel, block tin and lead tubing, hard or soft temper, the tube cutter available from Imperial Brass Mfg. Co., Chicago 7, Ill., will cut all sizes from ⅛ to 1-inch outside diameter. It features free wheeling action.

Check No. 26 on Reply Card for more Details

ELECTRODE: Lincoln Electric Co., Cleveland, O., announces an electrode for welding cast iron. Called Softweld, it is for depositing dense, soft machinable welds in gray iron castings. It is a nonferrous electrode and operates with soft steady arc on either alternating or direct current.

Check No. 27 on Reply Card for more Details

AIR COMPRESSOR: A vertical air compressor that saves floor space by having the tank upright and the motor and air compressor unit mounted on top is offered by Grimes Co., Dallas, Texas. It is available in three models.

Check No. 28 on Reply Card for more Details

RECORDING VIBROMETER: A new recording vibrometer which measures and records frequency, displacement and wave shape of mechanical vibration is available from General Electric's Special Products Division, Schenectady 5, N. Y.

Check No. 29 on Reply Card for more Details

TIME RECORDER: An improved, fully automatic attendance time recorder is announced by International Business Machines Corp., New York, N. Y. Employee inserts time card in receiver and registration is printed automatically.

Check No. 30 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Market Summary

STEELMAKERS are entertaining far more business than they can satisfy promptly but the signs indicate demand for steel is beginning to level out.

For the first time since before the war the steel markets are assuming some of the characteristics of normalcy. Buyers are pressing the mills and warehouses less frantically for tonnage. Here and there order cancellations are reported. Gray market operators are running for cover and slashing prices. Special steels are available for fairly prompt delivery. Customers' credit ratings are being scanned more closely, and mills and warehouses are exerting increasing efforts in cultivating the better accounts.

BALANCE— Slackened demand from some directions has stimulated hopes supply-demand balance in the major products will be struck soon. However, indications are balance still is months distant. The steel producers are holding large order backlogs and all the signs point to heavy consumption of items in critical supply for some time to come. Most of the large allocation programs have been voluntarily extended so that supply troubles of the general trade on this score will continue. The few order cancellations received by the mills to date have not affected the situation one iota.

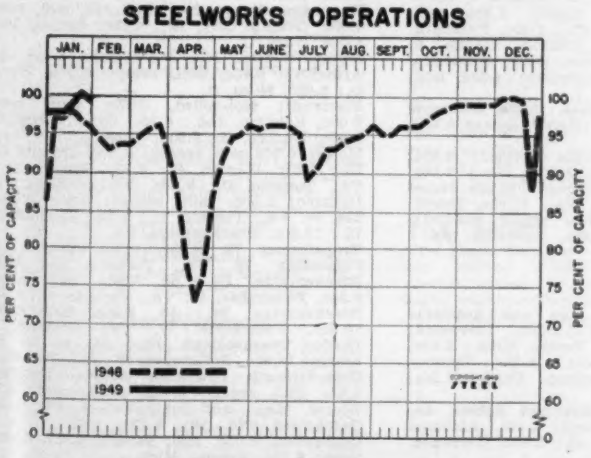
DEMAND— Expected rebound from the holiday and inventory season slump has materialized in only minor degree. Nevertheless, requirements for the leading products continue almost as pressing as ever. This is particularly true of flat-rolled items and pipe. The situation is almost as bad in the large sizes of hot-rolled bars and shapes. Plates also continue on the critical list but a few soft spots in demand for this product are appearing, chiefly in requirements of truck and bus builders, boilermakers and fuel oil tank manufacturers. Light bar shapes are moving at a slower pace seasonally, and tool steel demand is lagging. Change in the aircraft program is temporarily curbing demand for aircraft quality steels.

PIG IRON— Foundry demand for pig iron is brisk despite the fact prices on iron and cast grades of scrap are now practically in balance at some consuming points. Expectations are the normal price spread will soon be restored for the first time in years with cast scrap falling $2 to $3 per ton under pig iron. The urgent pressure for iron results from a desire of melters to increase the iron in their mix to a more normal ratio. Demand for castings is lagging.

SCRAP— Buying of steel mill scrap is exceedingly light with some brokers having virtually no new orders to work on at the moment. Steel mills throughout the country are estimated holding at least 1 million more tons of scrap than they did at this time a year ago. At the same time imports are substantial, in December totaling 105,524 tons from Germany alone. The greatest single factor in the present comfortable position of the mills with respect to scrap, however, has been the moderate winter weather which has permitted large collections, unhampered preparation and shipments. Over the past week prices on the various grades have been reduced further and there is as yet no sign the bottom has been reached.

PRICES— STEEL's arithmetical price composite dropped $1 further last week to $40.33 on steelmaking scrap and compared with $41.08 for the like week a year ago. Weakness in scrap also affected the composite for pig iron, since a Buffalo producer's pig iron price is based on the scrap market. Steelmaking pig iron price composite eased to $46.22 from $46.25 the preceding week, and compared with $39.22 for the like week a year ago. Composites held unchanged last week and compared with those for the like 1949 week as follows on finished and semifinished steel, respectively: $97.77 and $78.59; $75.75 and $65.60.

STEELWORKS OPERATIONS



DISTRICT STEEL RATES

Percentage of Ingot Capacity engaged in Leading Districts

	Week Ended Jan. 29	Change	Same Week 1948	Same Week 1947
Pittsburgh	99	None*	93	100.5
Chicago	98.5	None*	92.5	90
Eastern Pa.	97	None	91	88
Youngstown	105	None	103	88
Wheeling	86.5	— 6	93.5	89
Cleveland	97	— 2.5	95.5	95
Buffalo	104	None	81.5	90.5
Birmingham	100	None	100	99
New England	87	None	79	84
Cincinnati	103	— 1	97	91
St. Louis	84.5	None	78	62
Detroit	104	None	92	92
Estimated national rate	99.5	— 0.5	95.5	93

Based on weekly steelmaking capacity of 1,843,516 net tons for 1949; 1,802,476 net tons for 1948; 1,749,928 tons for 1947. *Revised.

COMPOSITE MARKET AVERAGES

Arithmetical Price Composites*

	Jan. 29	Jan. 22	Month Ago Dec. 1948	Year Ago Jan. 1948	5 Years Ago Jan. 1944
Finished Steel	$97.77	$97.77	$95.50	$78.26	$56.73
Semifinished Steel	75.75	75.75	75.75	60.46	36.00
Steelmaking Pig Iron	46.22	46.25	46.29	38.50	23.00
Steelmaking Scrap	40.33	41.33	43.25	40.75	19.17

FINISHED STEEL WEIGHTED COMPOSITE†

Dec. 1948	4.11778c
Nov. 1948	4.11778c
Oct. 1948	4.12950c
Dec. 1947	3.49055c
Dec. 1943	2.38649c

* **STRAIGHT ARITHMETICAL COMPOSITES:** Computed from average industry-wide mill prices on Finished Carbon Steel (hot-rolled sheets, cold-rolled sheets, cold-rolled strip, hot-rolled bars, plates, structural shapes, basic wire, standard nails, tin plate, standard and line pipe), on Semifinished Carbon Steel (re-rolling billets and slabs, sheet bars, skelp, and wire rods), on Basic Pig Iron (at eight leading producing points), and on Steelworks Scrap (No. 1 melting grade at Pittsburgh, Chicago and eastern Pennsylvania). Steel arithmetical composites, dollars per net ton; pig iron and scrap, gross ton.

† **FINISHED STEEL WEIGHTED COMPOSITE:** Computed in cents per pound, mill prices, weighted by actual monthly shipments of following products, representing about 82 per cent of steel shipments in the latest month for which statistics are available, as reported by American Iron & Steel Institute: Structural shapes; plates, standard rails; hot and cold-finished carbon bars; black butt weld pipe and tubes; black lap weld pipe and tubes; black electric weld pipe and tubes; black seamless pipe and tubes; drawn wire; nails and staples; tin and terne plate; hot-rolled sheets; cold-rolled sheets; galvanized sheets; hot-rolled strip; and cold-rolled strip. December, 1948 figure is preliminary.

COMPARISON OF PRICES

Representative market figures for current week; average for last month, three months and one year ago. Finished material (except tin plate) and wire rods, cents per lb; semifinished (except wire rods) and coke, dollars per net ton, others dollars per gross ton. Delivered prices represent lowest from mills.

Finished Materials

	Jan. 29, 1949	Dec. 1948	Oct. 1948	Jan. 1948
Steel bars, Pittsburgh mills	3.45c	3.45c	3.45c	2.90c
Steel bars, del. Philadelphia	3.8164	3.79	3.79	3.348
Steel bars, Chicago mills	3.35	3.35	3.35	2.90
Shapes, Pittsburgh mills	3.275	3.275	3.275	2.80
Shapes, Chicago mills	3.25	3.25	3.25	2.80
Shapes, del. Philadelphia	3.4918	3.48	3.48	2.966
Plates, Pittsburgh mills	3.50	3.50	3.50	2.80
Plates, Chicago mills	3.40	3.40	3.40	2.95
Plates, del. Philadelphia	3.7256	3.71	3.71	3.186
Sheets, hot-rolled, Pittsburgh mills	3.275	3.275	3.275	2.80
Sheets, cold-rolled, Pittsburgh	4.00	4.00	4.00	3.55
Sheets, No. 10 galv., Pittsburgh	4.40	4.40	4.40	3.90
Sheets, hot-rolled, Gary mills	3.25	3.25	3.25	2.80
Sheets, cold-rolled, Gary mills	4.00	4.00	4.00	3.55
Sheets, No. 10 galv., Gary mills	4.40	4.40	4.40	3.90
Strip, hot-rolled, Pittsburgh mills	3.275	3.275	3.275	2.80
Strip, cold-rolled, Pittsburgh mills	4.375	4.375	4.375	3.55
Bright basic, wire, Pittsburgh	4.325	4.325	4.325	3.675
Wire nails, Pittsburgh mills	5.775	5.775	5.775	4.625
Tin plate, per base box, Pitts. dist.	$6.70	$6.80	$6.80	$5.75

Semifinished

Sheet bars, mill	$67.00*	$67.00*	$67.00*	$53.57
Slabs, Chicago	52.00	52.00	52.00	40.18
Rerolling billets, Pittsburgh	59.00	59.00	59.00	40.18
Wire rod ⅜ to ½-inch, Pitts. dist.	3.775c	3.775c	3.775c	3.05c

* Nominal.

Pig Iron

	Jan. 29, 1949	Dec. 1948	Oct. 1948	Jan. 1948
Bessemer, del. Pittsburgh (N.&S. sides)	$48.08	$48.08	$48.08	$40.379
Basic, Valley	46.00	46.00	46.00	38.40
Basic, eastern del. Philadelphia	50.3002	50.17	50.17	41.372
No. 2 fdry., del. Pgh. (N.&S. sides)	47.58	47.58	47.58	39.879
No. 2 fdry., del. Philadelphia	50.8002	50.67	50.67	41.871
No. 2 foundry, Chicago	46.25	46.25	45.13	38.00
No. 2 foundry, Valley	46.50	46.50	43.50	36.50
Southern No. 2 Birmingham	43.38	43.38	43.38	34.88
Southern No. 2 del. Cincinnati	49.43	49.09	49.09	37.74
Malleable, Valley	46.50	46.50	46.50	38.90
Malleable, Chicago	46.50	46.50	45.38	39.10
Charcoal, low phos., fob Lyles, Tenn.	66.00	66.00	66.00	50.00
Ferromanganese, f.o.b. Etna, Pa.	163.00	163.00	163.00	151.00*

* F.o.b. cars Pittsburgh.

Scrap

Heavy melt. steel, No. 1, Pittsburgh	$40.00	$42.75	$42.75	$40.30
Heavy melt. steel, No. 2, E. Pa.	39.50	41.50	41.50	42.30
Heavy melt. steel, No. 1, Chicago	39.00	41.75	41.75	39.05
Heavy melt. steel, No. 1 Valley	37.75	42.75	42.75	40.04
Heavy melt. steel, No. 1 Cleveland	37.25	42.25	42.25	39.75
Heavy melt. steel, No. 1, Buffalo	45.50	48.50	48.15	43.30
Rails for rerolling, Chicago	57.50	70.38	65.50	60.00
No. 1 cast, Chicago	57.00	70.50	70.50	63.50

Coke

Connellsville, beehive furnace	$14.50	$14.50	$14.50	$12.50
Connellsville, beehive foundry	17.00	17.00	17.00	14.60
Chicago, oven foundry, ovens	20.40	20.40	20.40	19.19

FINISHED AND SEMIFINISHED IRON, STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per net ton, except as otherwise noted. Prices apply on an individual producer basis to products within the range of sizes, grades, finishes and specifications produced at its plants.

Semifinished Steel

Carbon Steel Ingots: Rerolling quality, standard analysis, open market, $100-$105 per gross ton. Forging quality, $50 per net ton, mill.

Alloy Steel Ingots: $51 per net ton, mill.

Rerolling Billets, Blooms, Slabs: $52 per net ton, mill, except: $62, Conshohocken, Pa.; $66, Monessen, Pa.; sales by smaller interests on negotiated basis at $85 per gross ton, or higher.

Forging Quality Billets, Blooms, Slabs: $61 per net ton, mill, except: $68, Conshohocken, Pa., mill.

Alloy Billets, Slabs, Blooms: Rerolling quality, $63 per net ton, mill except: $70, Conshohocken, Pa.

Sheet Bars: $67 nom., per net ton, mill; sales in open market $110-$115 per gross ton.

Skelp: 3.25c per lb, mill.

Tube Rounds: $76 per net ton, mill; some sellers quoting up to $120 per gross ton.

Wire Rods: Basic and acid open-hearth, 7/32 & ⅜-inch, inclusive, 3.40c per lb, mill, except: 3.65c, Struthers, O.; 3.70c, Worcester, Mass.; 4.05c, Pittsburg, Calif.; 4.10c, Portsmouth, O., Los Angeles; 4.15c Monessen, Pa. One producer quotes 3.90c, Chicago base. Basic open-hearth and bessemer, not resulphurized, 7/32 to 47/64-inch, inclusive, 3.50c, mill.

Bars

Hot-Rolled Carbon Bars (O.H. only; base 20 tons): 3.35c, mill, except: 3.55c, Ecorse, Mich., Pittsburgh, Monessen, Aliquippa, Pa.; 4.05c, Pittsburg, Torrance, Calif.; 4.10c, S. San Francisco, Los Angeles, Niles, Calif., Portland, Oreg., Seattle; 4.20c, Kansas City, Mo.; 4.25c, Minnequa, Colo.; 4.40c, Atlanta; 5.30c, Fontana, Calif.

Rail Steel Bars: (Base 10 tons): 3.35c, Moline, Ill., 5.10c, Williamsport, Pa.; another interest quotes 5.35c, mill.

Hot-Rolled Alloy Bars: 3.75c, mill, except: 4.05c, Ecorse, Mich.; 4.80c, Los Angeles; 5.50c, Fontana, Calif.

Cold-Finished Carbon Bars (Base 40,000 lb and over): 4.00c, mill, except: 3.95c, Pittsburgh, Cumberland, Md.; 4.20c, Indianapolis; 4.25c, Monessen, Pa.; 4.30c, Ecorse, Mich.; 4.35c, St. Louis; 4.36c, Plymouth, Mich.; 4.40c, Newark, N. J., Hartford, Putnam, Conn., Mansfield, Readville, Mass.; 4.50c; Camden, N. J.; 5.30c, Los Angeles.

Cold-Finished Alloy Bars: 4.65c, mill, except: 4.75c, Monessen, Pa.; 4.85c, Indianapolis; 4.95c, Worcester, Mansfield, Mass., Hartford.

High-Strength, Low-Alloy Bars: 5.10c, mill, except 5.30c, Youngstown; 5.40c, Ecorse, Mich.

Reinforcing Bars (New Billet): 3.35c, mill, except: 3.55c, Monessen, Pa.; 4.05c, Pittsburg, Torrance, Calif.; 4.10c, Atlanta, Seattle, S. San Francisco, Los Angeles; 4.25c, Minnequa, Colo. Fabricated: To consumers: 4.25c, mill, except: 5.00c, Seattle.

Reinforcing Bars (Rail Steel): 4.65c, Williamsport, Pa., mill; another interest quotes 5.35c, mill.

Wrought Iron Bars: Single Refined: 8.60c, (hand puddled), McKees Rocks, Pa.; 9.50c, Economy, Pa. Double Refined: 11.25c (hand puddled), McKees Rocks, Pa., 11.00c, Economy, Pa. Staybolt: 12.75c, (hand puddled), McKees Rocks, Pa.; 11.30c, Economy, Pa.

Sheets

Hot-Rolled Sheets (18 gage and heavier): 3.25c, mill, except: 3.25-3.30c, Cleveland; 3.30c, Pittsburgh; 3.45c, Ecorse, Mich.; 3.95c, Pittsburg, Torrance, Calif.; 5.00c, Conshohocken, Pa.; 5.65c, Fontana, Calif.; 6.25c, Kansas City, Mo.

Hot-Rolled Sheets (19 gage and lighter, annealed): 4.15c, mill, except: 4.40c, Alabama City, Ala.; 4.65c, Niles, O.; 5.05c, Torrance, Calif., Kokomo, Ind.

Cold-Rolled Sheets: 4.00c, mill, except: 4.20c, Ecorse, Mich.; 4.70c, Granite City, Ill.; 4.95c, Pittsburg, Calif.

Galvanized Sheets, No. 10: (Based on 5 cent zinc) 4.40c, mill, except: 5.00c, Niles, O.; 5.15c, Pittsburg, Torrance, Calif.; 5.30c, Kokomo, Ind.

Galvannealed Sheets: 4.95c, mill, except: 5.05c, Indiana Harbor, Ind.; 5.55c, Niles, O.; 5.70c, Kokomo, Ind.

Culvert Sheets, No. 16 flat Copper Steel (based on 5-cent zinc): 5.00c, mill, except: 5.40c, Granite City, Ill.; 5.45c, Kokomo, Ind.; 5.75c, Pittsburg, Torrance, Calif.

Long Ternes, No. 10 (Commercial quality): 4.80c, mill.

Enameling Sheets, No. 12: 4.40c, mill, except: 4.60c, Granite City, Ill.; 4.70c, Ecorse, Mich.; 6.00c, Niles, O.

Silicon Sheets, No. 24: Field: 5.15c, mill. Armature: 5.45c, mill, except: 5.95c, Warren, O.; 6.05c, Niles, O.

Electrical: Hot-rolled, 5.95c, mill, except: 6.05c, Kokomo, Ind.; 6.15c, Granite City, Ill.; 6.45c, Warren, O.; 6.55c, Niles, O.

Motor: 6.70c mill except: 6.90c, Granite City, Ill.; 7.20c, Warren, O.; 7.95c, Follansbee, W. Va., Toronto, O.; 9.20c, Brackenridge, Pa.

Dynamo: 7.50c, mill, except: 8.65c, Follansbee, W. Va., Toronto, O.; 7.70c, Granite City, Ill.; 10.00c, Brackenridge, Pa.

Transformer 72, 8.05c, mill, except: 9.15c, Follansbee, W. Va., Toronto, O.; 11.80c, Brackenridge, Pa.; **65,** 8.60c, mill, except: 9.85c, Follansbee, W. Va., Toronto, O.; 12.35c, Brackenridge, Pa.; **58,** 9.30c, mill except: 10.55c, Follansbee, W. Va., Toronto, O.; 13.05c, Brackenridge, Pa.; **52,** 10.10c, mill, except: 11.35c, Follansbee, W. Va., Toronto, O.

High-Strength Low-Alloy Sheets: Hot-rolled, 4.95c, mill, except: 5.15c, Youngstown; 5.25c, Ecorse, Mich., and Conshohocken, Pa., mills.

Galvanized (No. 10), 6.75c, mill.

Cold-rolled, 6.05c, mill, except: 6.25c, Youngstown; 6.35c, Ecorse, Mich.

Strip

Hot-Rolled Strip: 3.25c mill, except: 3.30c, Cleveland, Pittsburgh, Riverdale, Ill.; 3.25-3.35c,* Sharon, Pa.; 3.45c, Ecorse, Mich.; 3.60c, Detroit; 3.65c, Atlanta; 3.70c, West Leechburg, Pa.; 4.00c, Pittsburg, Torrance, Calif.; 4.25c, Seattle, S. San Francisco, Los Angeles; 4.20c, Kansas City, Mo.; 4.30c, Minnequa Colo.; 5.90c, Fontana, Calif. One company quotes 4.90c, Pittsburgh base.

* Wider than 6-in. and 6-in. and narrower respectively.

Cold-Rolled Strip (0.25 carbon and less): 4.00c, mill, except 4.00-4.25c, Warren, O.; 4.00-4.50c, Youngstown; 4.20c, Ecorse, Mich.; 4.25c, Riverdale, Ill.; 4.40-4.50c, Detroit; 4.50c, New Haven, Conn., West Leechburg, New Castle, Pa., Boston; 4.75c, Dover, O., New Kensington, Pa.; 4.50-5.00c, Trenton, N. J.; 4.80-5.05c, Wallingford, Conn.; 5.75c, Los Angeles; 7.10c, Fontana, Calif. One company quotes 4.55c, Cleveland or Pittsburgh base, and 4.75c, Worcester, Mass., base; another, 5.00c, Pittsburgh base.

Cold-Finished Spring Steel: 0.26-0.40 C, 4.00c, mill, except: 4.25c, Dover, O., Chicago; 4.30c, Worcester, Mass.; 4.50c, New Castle, Pa., Boston, Youngstown; 4.75c, Wallingford, Conn. Over 0.40 to 0.60 C, 5.50c, mill, except: 5.65c, Chicago; 5.75c, Dover, O.; 5.80c, Worcester, Mass., Wallingford, Conn., Trenton, N. J.; 5.95c, Boston; 6.00c, New Castle, Pa. Over 0.60 to 0.80 C, 6.10c, mill, except: 6.25c, Chicago; 6.35c, Dover, O.; 6.40c, Worcester, Mass., Wallingford, Bristol, Conn., Trenton, N. J.; 6.60c, New Castle, Pa. Over 0.80 to 1.05 C, 8.05c, mill, except: 7.85c, Dover, O.; 8.20c, Chicago; 8.35c, Worcester, Mass., Bristol, Conn., Trenton, N. J. Over 1.05 to 1.35 C, 10.35c, mill, except: 10.15c, Dover, O.; 10.30c, Wallingford, Conn.; 10.50c, Chicago; 10.65c, Worcester, Mass., Trenton, N. J.

Cold-Rolled Alloy Strip: 9.50c, mill except: 9.80c, Worcester, Mass.

High-Strength, Low-Alloy Strip: Hot-rolled, 4.95c, mill, except: 5.15c, Youngstown; 5.25c, Ecorse, Mich., mill. Cold-rolled, 6.05c, mill, except: 6.25c, Youngstown; 6.35c, Ecorse Mich., mill.

Tin, Terne Plate

Tin Plate: American Coke, per base box of 100 lb, 1.25 lb coating $7.50-$7.70; 1.50 lb coating $7.75-$7.95. Pittsburg, Calif., mill $8.25 and $8.50, respectively, for 1.25 and 1.50 lb coatings.

Electrolytic Tin Plate: Per base box of 100 lb, 0.25 lb tin, $6.45-$6.65; 0.50 lb tin, $6.70-$6.90; 0.75 lb tin, $7.00-$7.20.

Can Making Black Plate: Per base box of 100 lb, 55 to 128 lb basis weight $5.75-$5.85. Pittsburg, Calif., mill, $6.50.

Holloware Enameling Black Plate: 29-gage, 5.30c per pound, except: 5.40c, Sparrows Point, Md.; 5.50c, Granite City, Ill.

Manufacturing Ternes (Special Coated): Per base box of 100 lb, $6.65, except: $6.75 Fairfield, Ala., Sparrows Point, Md.

Roofing Ternes: Per package 112 sheets; 20 x 28 in., coating I.C. 8-lb, $15.50.

Plates

Carbon Steel Plates: 3.40c, mill, except: 3.40-3.60c, Cleveland; 3.45c, Sparrows Point, Md., Johnstown, Pa., Lackawanna, N. Y.; 3.60c, Pittsburgh; 3.65c, Ecorse, Mich.; 3.75c, Coatesville, Pa.; 3.95c, Claymont, Del., Conshohocken, Pa.; 4.30c, Seattle, Minnequa, Colo.; 4.56c, Houston, Tex.; 5.80c, Fontana, Calif.; 6.50c, Harrisburg, Pa.; 6.25c, Kansas City, Mo.

Floor Plates: 4.55c, mill.

Open-Hearth Alloy Plates: 4.40c, mill, except: 5.10c, Coatesville, Pa., mill.

High-Strength, Low-Alloy Plates: 5.20c mill, except: 5.10c, Coatesville, Pa.; 5.30c, Conshohocken, Pa., Sparrows Point, Md., Johnstown, Pa.; 5.40c, Youngstown; 5.65c, Ecorse, Mich., Sharon, Pa.

Shapes

Structural Shapes: 3.25c, mill, except: 3.30c, Bethlehem, Pa., Lackawanna, N. Y., Johnstown, Aliquippa, Pa.; 3.85c, Torrance, Calif.; 4.15c, Minnequa, Colo.; 4.30c, Seattle, S. San Francisco, Los Angeles; 5.75c, Fontana, Calif.

Alloy Structural Shapes: 4.05c, mill.

Steel Sheet Piling: 4.05c, mill.

High-Strength, Low-Alloy Shapes: 4.95c, mill, except: 5.05c, Bethlehem, Johnstown, Pa., Lackawanna, N. Y.; 5.15c, Youngstown.

Wire and Wire Products

Wire to Manufacturers (carloads): Bright, Basic or Bessemer Wire, 4.15c, mill, except: 4.25c, Sparrows Point, Md., Kokomo, Ind.; 4.45c, Worcester, Mass.; 4.50c, Monessen, Pa.; Minnequa, Colo., Atlanta, Buffalo; 4.70c, Portsmouth, O.; 4.80c, Palmer, Mass.; 5.10c, Pittsburg, Calif.; 5.15c, S. San Francisco; 5.40c, Shelton, Conn. One producer quotes 4.50c, Chicago base; another, 4.50c, Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

Basic MB Spring Wire, 5.55c, mill, except: 5.30c, Portsmouth, O.; 5.65c, Sparrows Point, Md., Monessen, Pa.; 5.85c, Worcester, Palmer, Mass., Trenton, N. J.; 6.50c, Pittsburg, Calif.

Upholstery Spring Wire, 5.20c mill, except: 5.30c, Sparrows Point, Md., Williamsport, Pa.; 5.50c, Worcester, Mass., Trenton, N. J., New Haven, Conn.; 6.15c, Pittsburg, Calif.

Wire Products to Trade (carloads): Merchant Quality Wire: Annealed (6 to 8 Gage base), 4.80c, mill, except: 4.90c, Sparrows Point, Md.; 4.95c, Monessen, Pa.; 5.10c, Worcester, Mass.; 5.15c, Minnequa, Colo., Kokomo, Ind.; 5.20c, Atlanta; 5.75c, S. San Francisco, Pittsburg, Calif. One producer quotes 5.15c, Chicago and Pittsburgh base; another, 5.20c. Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

Galvanized (6 to 8 Gage base), 5.25c, mill, except: 5.35a, Sparrows Point, Md.; 5.40c, Aliquippa, Monessen, Pa.; 5.55c, Worcester, Mass.; 5.60c, Kokomo, Ind., Minnequa, Colo.; 5.65c, Atlanta; 6.20c, Pittsburgh, S. San Francisco, Calif. One producer quotes 5.60c, Pittsburgh and Chicago base; another, 5.65c, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh, and Pittsburgh.

Nails and Staples: Standard, cement-coated and galvanized nails and polished and galvanized staples, Column 103, mill, except: 105, Sparrows Point, Md., Kokomo, Ind.; 109 Worcester, Mass.; 110 Minnequa, Colo., Atlanta; 117, Portsmouth, O.; 123, Pittsburg, Calif.; 124, Cleveland; 126, Monessen, Pa.; $6.75 per 100 pound keg, Conshohocken, Pa., Wheeling, W. Va. One producer quotes column 109, Chicago and Pittsburgh base; another, column 113, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

Woven Fence (9 to 15½ Gage, inclusive): Column 109, mill, except: 113, Monessen, Pa., Kokomo, Ind.; 116, Minnequa, Colo.; 121 Atlanta; 132, Pittsburg, Calif. One producer quotes column 113, Pittsburgh and Chicago base; another column 114, Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

Barbed Wire: Column 123 mill, except: 125, Sparrows Point, Md., Kokomo, Ind.; 126, Atlanta; 128, Monessen, Pa.; 130, Minnequa, Colo.; 143, Pittsburg, Calif.; 145, S. San Francisco. One producer quotes 127, Chicago and Pittsburgh base.

Fence Posts (with clamps): Column 114, Duluth; 115, Johnstown, Pa.; 116, Moline, Ill.; 122, Minnequa, Colo.; $123.50 per net ton, Williamsport, Pa.

Bale Ties (single loop): Column 106, mill, except: 108, Sparrows Point, Md., Kokomo, Ind.; 110, Atlanta; 113 Minnequa, Colo.; 130, S. San Francisco, Pittsburg, Calif. One producer quotes column 115, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

Stainless Steels

(Mill prices, cents per pound)

CHROMIUM NICKEL STEELS

Type No.	Bars, Wire Shapes	Strip, Cold-Rolled	Sheets
301	28.50-28.75	30.50-32.00	37.50-40.75
302	28.50-28.75	33.00-33.75	37.50-40.75
303	31.00-31.50	36.50-39.75	39.50-43.00
304	30.00-31.25	35.00-35.75	39.50-43.00
316	46.00-48.00	55.00-57.25	53.00-57.25
347	38.50-39.75	48.50-50.25	50.00-54.00

STRAIGHT CHROMIUM STEELS

410	22.75-23.00	26.50-27.00	32.00-33.00
416	23.25-23.50	28.25-33.50	32.50-33.50
430	23.25-23.50	27.00-27.50	34.75-35.50
446	32.50-33.00	60.00-62.25	46.50-50.00

STAINLESS-CLAD STEELS

	Plates —Cladding— 10%	Plates —Cladding— 20%	Sheets —Cladding— 10%	Sheets —Cladding— 20%
302	....	....	19.75	21.50
304	22.50	26.50	20.75	22.50
310	32.50	36.50	....	....
316	27.00	31.00	26.00	28.00
321	23.50	27.50	....	....
347	25.00	29.00	24.00	26.00
405	18.75	24.75	....	....
410	18.25	24.25	....	....
430	18.25	24.25	....	....

Tool Steels

Tool Steel: Cents per pound, producing plants; reg. carbon 19.00c; extra carbon 22.00c; special carbon 26.50c; oil-hardening 29.00c; high carbon-chromium 52.00c; chrome hot work, 29.00c.

W	Cr	V	Mo	Co	Base Per lb
18	4	1	...	...	90.50c
18	4	2	...	...	102.50c
18	4	3	...	...	114.50c
18	4	2	...	9	168.50c
1.5	4	1	8.5	...	65.00c
6.4	4.5	1.9	5	...	69.50c
6	4	3	6	...	88.00c

Tubular Goods

Standard Steel Pipe: Mill prices in carlots, threaded and coupled, to consumers about $200 a net ton.

In.	Butt Weld Blk.	Butt Weld Gal.	In.	Butt Weld Blk.	Butt Weld Gal.
⅛	39½-	8½-	1	46-	25-
	41½	12½		48½	27½
¼	37½-	9½-	1¼	46½-	25½-
	39½	14		49	28
⅜	34-	4½-	1½	47-	26-
	36	9		49½	28½
			2	47½-	26½-
½	40½-	18-		50	29
	43	21½	2½, 3	48-	27-
¾	43½-	22-		50½	29½
	46	24½	3½ & 4	44½	22½

In.	Lap Weld Blk.	Lap Weld Gal.	Elec. Weld Blk.	Elec. Weld Gal.	Seamless Blk.	Seamless Gal.
2	39½	17½	38½	16½	27-	5-
					38½	17
2½	42¼-	20½-	41½	19½	32½-	10½-
	43½	21½			41½	20
3	42½-	20½-	41½	19½	35-	15-
	43½	21½			41½	20
3½&4	42½-	20½-	43½	21½	39½-	16½-
	46½	24½			43½	22
5 & 6	42½-	20½-	43½	21½	38½-	16½-
	44½	22½			43½	22
7	....	....	....	....	48¼	20½

Line Steel Pipe: Mill prices in carlots to consumers about $200 a net ton.

In.	Butt Weld Blk.	Butt Weld Gal.	In.	Butt Weld Blk.	Butt Weld Gal.
⅛	40½	....	1¼	46-	26-
¼	38½	....		48	27
⅜	35	....	1½	46½-	26½-
½	40-	18½-		48½	27½
	42	19½	2	47-	28½-
¾	43-	22½-		49	28
	45	23½	2½ & 3	47½-	27-
1	45½-	25½-		49½	28½
	47½	26½	3½ & 4	43½	....

In.	Lap Weld Blk.	Lap Weld Gal.	Elec. Weld Blk.	Elec. Weld Gal.	Seamless Blk.	Seamless Gal.
2	38½	16½	37½	15½	26-	4-
					37½	16
2½	42½	20½	40½	19½	31½-	9½-
					40½	19
3	42½	20½	40½	19½	34-	12-
					40½	19
3½-4	41½-	20-	42½	20½	37½-	15½-
	45½	23½			42½	21
5 & 6	41½-	20	42½	20½	37½-	15½-
	43½				42½	21
8	45½	....	44½	21½-	40½-	17½-
				22	44½	22
10	45	....	44	21-	41½-	18½-
				21½	44	21½
12	44	....	43	20	40½-	17½-
					43	20½

Standard Wrought Iron Pipe: Mill price in carlots, threaded and coupled, to consumers about $200 a net ton.

In.	Butt Weld Blk.	Butt Weld Gal.	In.	Lap Weld Blk.	Lap Weld Gal.
⅜	+59½	+95½	1¼	+22	+53
½	+20½	+52½	1½	+15½	+45½
¾	+10½	+41½	2	+ 7½	+36½
1 and			2½-3½	+ 5	+32
1¼	+ 4½	+32½	4	List	+26
1½	— 1½	+29	4½-8	+ 2	+27½
2	— 2	+28½	9-12	+12	+37

Boiler Tubes: Net base c.l. prices, dollars per 100', mill; minimum wall thickness, cut lengths 4 to 24'; inclusive.

O.D. B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1 13	.....	13.39-14.64	13.00	13.00
1¼ 13	.....	15.87-17.34	13.21	15.30
1½ 13	16.45	17.71-19.35	14.60	17.13
1¾ 13	18.71	20.15-22.02	16.60	19.54
2 13	20.96	22.56-24.66	18.60	21.89
2¼ 13	23.36	25.16-27.50	20.73	24.40
2¼ 12	23.54-25.73	27.70-30.28	22.83	26.85
2½ 12	25.79-28.19	30.33-33.15	25.02	29.41
2¾ 12	27.33-29.87	32.14-35.13	26.51	31.18
3 12	28.68-31.35	33.76-36.90	27.82	32.74
3¼ 11	33.39-36.50	39.29-42.95	32.39	38.11
3½ 11	35.85-39.19	42.20-46.13	34.78	40.94
4 10	44.51-48.65	52.35-57.22	43.17	50.78
4½ 9	58.99-64.47	69.42-75.88	....	....
5 9	68.28-74.64	80.35-87.82	....	....
6 7	104.82-114.57	123.33-134.81	....	....

Pipe, Cast Iron: Class B, 6-in. and over, $106.50 per net ton, Birmingham; $106.70, del. Chicago; 4-in. pipe, $5 higher; Class A pipe, $5 a ton over Class B.

Rails, Supplies

Rails: Standard, over 60-lb; **$3.20 per 100 lb.** mill, except: $3.50, Indiana Harbor, Ind., and Minnequa, Colo.

Light (billet): $3.55 per 100 lb, mill, except: $4.25, Minnequa, Colo.

Light (rail steel): $5.10 per 100 lb, Williamsport, Pa.

Railroad Supplies: Track bolts, treated: **$8.50** per 100 lb, mill. Untreated: $8.25, mill.

Tie Plates: 4.05c mill, except: **4.20c, Pittsburg,** Calif.; 4.50c, Seattle.

Splice Bars: 4.25c, mill.

Standard Spikes: 5.35c, mill, except: **5.25c,** Pittsburgh.

Axles: 5.20c, mill.

RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax.

Pig Iron

Per gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa., furnace	$48.00	$48.50	$49.00	$49.50
Newark, N. J., del.	50.5334	51.0334	51.5334	52.0334
Brooklyn, N. Y., del.	....	52.634	53.134	....
Philadelphia, del.	50.3002	50.8002	51.3002	51.8002
Birmingham, furnace	42.88	43.38	....	....
Cincinnati, del.	....	49.43	....	....
Buffalo, furnace	47.00	47.00	47.50	48.00
Boston, del.	56.20	56.20	56.70	....
Rochester, del.	49.35	49.35	49.85	50.35
Syracuse, del.	50.2065	50.2065	50.7065	41.2065
§**Chicago**, district furnaces	46.00	46.00-46.50	46.50	47.00
Milwaukee, del.	47.82	47.82-48.32	48.32	48.82
Muskegon, Mich., del.	....	51.28-51.78	51.78	....
Cleveland, furnace	46.00	46.50	46.50	47.00
Akron, del.	48.3002	48.8002	48.8002	49.3002
Lone Star, Tex., furnace	....	†75.00	....	....
Duluth, furnace	....	46.50	46.50	47.00
Erie, Pa., furnace	46.00	46.50	46.50	47.00
Everett, Mass., furnace	....	52.75	53.25	....
Geneva, Utah, furnace	46.00	46.50	....	....
Seattle, Tacoma, Wash., del.	....	54.0578	....	....
Portland, Oreg., del.	....	54.0578	....	....
Los Angeles, San Francisco	53.5578	54.0578	....	....
Granite City, Ill., furnace	47.90	48.40	48.90	....
St. Louis, del.	49.40	49.90	50.40	....
Ironton, Utah, furnace	....	46.50	....	....
‡**Neville Island, Pa.**, furnace	46.00	46.50	46.50	47.00
Pittsburgh, del., N.&S. Sides	47.08	47.58	47.58	48.08
Pittsburgh (Carnegie), furnaces	46.00	....	....	47.00
Sharpsville, Pa., furnace	46.00	46.50	46.50	47.00
Steelton, Pa., furnace	48.00	48.50	49.00	49.50
Struthers, O., furnace	42.50	....	....	....
Swedeland, Pa., furnace	50.00	50.50	51.00	....
Toledo, O., furnace	46.00	46.50	46.50	47.00
Cincinnati, del.	50.8230	51.3230	....	....
Youngstown, O., furnace	46.00	46.50	46.50	47.00
Mansfield, O., del.	50.1022	50.6022	50.6022	51.1022

† Low phosphorus southern grade.

‡ To Neville Island base add: $0.86 for McKees Rocks, Pa.; $1.31 Lawrenceville, Homestead, McKeesport, Monaca; $1.73 Verona; $1.94 Brackenridge; $1.08 for Ambridge and Aliquippa.

§ Includes, in addition to Chicago, South Chicago, Ill., East Chicago, Gary and Indiana Harbor, Ind.

Blast Furnace Silvery Pig Iron

6.00-6.50 per cent Si (base) $59.50
6.51-7.00 .. 60.75
7.01-7.50 .. 62.00
7.51-8.00 .. 63.25
8.01-8.50 .. 64.50
8.51-9.00 .. 65.75
9.01- 9.50. 67.00
9.51-10.00. 68.25
10.01-10.50. 69.50
10.51-11.00. 70.75
11.01-11.50. 72.00

F.o.b. Jackson, O., per gross ton. Buffalo furnace $1.25 higher.

Bessemer Ferrosilicon

Prices same as for blast furnace silvery iron, plus $1 per gross ton.

Electric Furnace Silvery Pig Iron Si 14.01-14.50%, $84.75 furnace, Niagara Falls; $84 open-hearth and $85 foundry grade, Keokuk, Iowa. Piglets, Si 18%, $91, Keokuk, Iowa. Add $1 a ton for each additional 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 a ton for 0.45% max. phos.

Charcoal Pig Iron

Semi-cold blast, low phosphorus. F.o.b. furnace, Lyles, Tenn. ..$66 (For higher silicon iron a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Low Phosphorus

Steelton, Pa., $54; Buffalo, Troy, N. Y., $50; Philadelphia, $56.9786 delivered.

Intermediate phosphorus, Central furnace, Cleveland, $51.

Electrodes

(Threaded, with nipples, unboxed)

Diam. (Inches)	Length	Cents per lb, f.o.b. plant
	Graphite	
17, 18, 20	60, 72	16.00
8 to 16	48, 60, 72	16.50
7	48, 60	17.75
8	48, 60	19.00
4, 5⅛	40	19.50
3	40	20.50
2½	24, 30	21.00
2	24, 30	23.00
	Carbon	
40	100, 110	7.50
35	100, 110	7.50
30	84, 110	7.50
24	72 to 104	7.50
17 to 20	84, 90	7.50
14	60, 72	8.00
10, 12	60	8.25
8	60	8.50

Fluorspar

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $37; less than 60%, $34.

Metallurgical Coke

Price per Net Ton

Beehive Ovens

Connellsville, furnace	$13.50-15.50
Connellsville, foundry	16.00-18.00
New River, foundry	16.50
Wise county, foundry	15.35
Wise county, furnace	14.60

Oven Foundry Coke

Kearney, N. J., ovens	$22.00
Everett, Mass., ovens	
New England, del.‡	23.35
Chicago, ovens	20.40
Chicago, del.	†21.85
Detroit, del.	24 16
Terre Haute, ovens	21.00
Milwaukee, ovens	21.15
Indianapolis, ovens	20.85
Chicago, del.	24.19
Cincinnati, del.	23.66
Detroit, del	24.61
Ironton, O., ovens	19.40
Cincinnati, del.	21.63
Painesville, O., ovens	20.90
Buffalo, del.	23.42
Cleveland, del.	22.55
Erie, del.	22.70
Birmingham, ovens	17.70
Philadelphia, ovens	21.05
Swedeland, Pa., ovens	21.00
Portsmouth, O., ovens	19.50
Detroit, ovens	20.65
Detroit, del.	*21.70
Buffalo, del.	22.75
Flint, del.	22.98
Pontiac, del.	21.98
Saginaw, del.	23.30

Includes representative switching charge of: *, $1.05; †, $1.45. ‡ Or within $4.03 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

(Price effective as of Aug. 5)

Pure benzol	20.00
Toluol, one degree	20.50-26.50
Toluol, two degrees	23.00-26.50
Industrial xylol	20.50-26.50

Per ton bulk, ovens

Sulphate of ammonia	$45.00

Per pound, ovens

(Effective as of Oct. 1)

Phenol, 40 (carlots, returnable drums)	13.50
Do., less than carlots	14.25
Do., tank cars	12.50

(Effective as of Oct. 25)

Naphthalene flakes, balls, bbl to jobbers, "household use"	13.75

Refractories

(Prices per 1000 brick, f.o.b. plant)

Fire Clay Brick

Super Duty: St. Louis, Vandalia, or Farber, Mo., Olive Hill, Ky., Clearfield, or Curwensville, Pa., Ottawa, Ill., $100.

High-heat Duty: Salina, Pa., $85; Woodbridge, N. J., St. Louis, Farber, or Vandalia, Mo., West Decatur, Orviston, Clearfield, Beach Creek, or Curwensville, Pa., Olive Hill, Hitchins, Haldeman, or Ashland, Ky., Troup, or Athens, Tex., Stevens Pottery, Ga., Portsmouth, or Oak Hill, O., Ottawa, Ill., $80.

Intermediate-Heat Duty: St. Louis, or Vandalia, Mo., West Decatur, Orviston, Beach Creek, or Clearfield, Pa., Olive Hill, Hitchins, or Haldeman, Ky., Athens, or Troup, Tex., Stevens Pottery, Ga., Portsmouth, O., Ottawa, Ill., $74.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Pa., Bessemer, Ala., Ottawa, Ill., $66.

Ladle Brick

Dry Press: $55, Freeport, Merill Station, Clearfield, Pa.; Chester, New Cumberland, W. Va.; Irondale, Wellsville, O.

Wire Cut: $53, Chester, New Cumberland, W. Va.; Wellsville, O.

Malleable Bung Brick

St. Louis, Mo., Olive Hill, Ky., $90; Beach Creek, Pa., $80.

Silica Brick

Mt. Union, Claysburg, or Sproul, Pa., Ensley, Ala., $80; Hays, Pa. $85; Joliet or Rockdale, Ill., E. Chicago, Ind., $89; Lehi, Utah, Los Angeles, $95.

Eastern Silica Coke Oven Shapes: Claysburg, Mt. Union, Sproul, Pa., Birmingham, $80.

Illinois Silica Coke Oven Shapes: Joliet or Rockdale, Ill., E. Chicago, Ind., Hays, Pa., $81.

Basic Brick

(Base prices per net ton; f.o.b. works, Baltimore or Chester, Pa.)

Chrome brick or chemical-bonded chrome brick, $69, magnesite brick, $91, chemical-bonded magnesite, $80.

Magnesite

(Base prices per net ton, f.o.b. works, Chewelah, Wash.)

Domestic dead-burned, ¾" grains; Bulk, $30.50-31.00; single paper bags, $35.00-35.50.

Dolomite

(Base prices per net ton)

Domestic, dead-burned bulk: Bilmeyer, Blue Bell, Williams, Plymouth Meeting, Pa., Millville, W. Va., Nario, Millersville, Martin, Gibonsburg, Woodville, O., $12.25; Thornton, McCook, Ill., $12.35; Dolly Siding, Bonne Terre, Mo., $12.45.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural) Lower Lake Ports

(Any increase or decrease in R. R. freight rates, dock handling charges and taxes thereon effective after Dec. 31, 1948, are for buyer's account.)

Old range bessemer	$7.60
Old range nonbessemer	7.45
Mesabi bessemer	7.35
Mesabi nonbessemer	7.20
High phosphorus	7.20

Eastern Local Ore

Cents, units, del. E. Pa.

Foundry and basic 56.62% concentrates, contract	16.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%	15.00
Brazil iron ore, 68-69%	19.50

Tungsten Ore

Wolframite and scheelite per short ton unit, duty paid	$26-$28

Manganese Ore

48-50%, duty paid, f.o.b. cars, New York, Philadelphia, Baltimore, Norfolk, Va., Mobile, Ala., New Orleans, 67.60c-72.60c.

Chrome Ore

Gross ton f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S.C., plus ocean freight differential for delivery to Portland, Oreg., and/or Tacoma, Wash. (S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African	
48% 2.8:1	$37.50
48% 3:1	39.00
48% no ratio	31.00
South African (Transvaal)	
44% no ratio	$25.50-$26.00
45% no ratio	26.50
48% no ratio	29.00-30.00
50% no ratio	29.50-30.50
Brazilian—nominal	
44% to 2.5:1 lump	$33.65
Rhodesian	
45% no ratio	$27-$27.50
48% no ratio	30.00
48% 3:1 lump	39.00
Domestic (seller's nearest rail)	
48% 3:1	$39.00

Molybdenum

Sulphide conc., lb, Mo., cont., Mines	$0.75

WAREHOUSE STEEL PRICES

Prices, cents per pound, for delivery within switching limits, subject to extras.

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H-R 10 Ga.	C-R 17 Ga.	Gal. *10 Ga.	†H-R	†C-R	H-R Rds. ⅜" to 3"	C-F Rds. ½" & up	H-R Alloy **4140		Carbon ⅜"-¾"	Floor ⅜" & Thicker
Boston (city) ..	5.84	6.64	7.84	6.04	6.90	5.69	6.39	8.24-9.74	5.54	5.89	7.34
Boston (c'try) .	5.69	6.49	7.69	5.89	6.75	5.54	6.24	8.09-9.59	5.39	5.74	7.19
New York (city)	5.73-5.80	6.73	7.74-7.83	6.08-6.28	...	5.73	6.58	8.67	5.52-5.78	5.98	7.48
New York(c'try)	5.53-5.60	6.53	7.54-7.63	5.88-6.08	...	5.53	6.38	...	5.32-5.58	5.78	7.28
Phila. (city)...	5.72	6.64	7.53-7.58	5.49-5.59	...	5.60	6.34	8.40	5.25	5.53	6.76-7.19
Phila. (c'try)..	5.57	6.59	7.38-7.43	5.34-5.44	...	5.45	6.19	8.25	5.10	5.38	6.61-7.04
Balt. (city) ...	5.46†	6.36	7.26	5.52	...	5.57	6.31	...	5.51	5.71	7.16
Balt. (c'try)...	5.31†	6.21	7.11	5.37	...	5.42	6.16	...	5.36	5.56	7.01
Norfolk, Va. ..	5.80	...	...	...	...	6.05	7.05	...	6.05	6.05	7.55
Wash. (w'hse).	5.84-6.00	...	...	5.90	...	5.91-5.95	6.61	...	5.85-5.89	6.05-6.09	7.50-7.54
Buffalo (del.)..	5.00	5.90	7.85	5.49	6.50	5.20	6.05	10.13	5.25	5.50	7.06
Buffalo (w'hse)	4.85	5.75	7.70	5.34	6.35	5.05	5.90	9.98	5.10	5.35	6.91
Pitts. (w'hse)..	4.85-5.00§	5.75-5.85§	7.15-7.70	5.00-5.35	5.95-6.00	4.90-5.10	5.65	7.65	4.90-5.15	5.05-5.25	6.55
Detroit (w'hse).	4.85-5.00§	5.75-5.85§	7.15	5.00-5.35	5.95-6.00	5.45	6.17	8.12	5.45	5.65-5.80	7.10
Cleveland (del.)	5.13-5.90‡‡	5.90-6.31	7.35-8.10‡‡	5.18-5.31	6.60-6.85	5.32-5.36	6.05-6.12	8.24-8.56	5.35-5.62	5.52-5.56	6.95-7.01
Cleve. (w'hse).	4.98-5.75	5.75-6.16	7.20-7.95	5.03-5.16	6.70	5.17-5.21	5.90-5.97	8.24-8.41	5.21-5.47	5.37-5.41	6.80-6.86
Cincin. (w'hse).	5.29	6.14	7.63	5.55	6.10	5.55	6.10	...	5.40	5.64	6.94
Chicago (city).	5.20	5.90‡§	7.30	5.00	6.67-6.80	5.05	5.85	8.25[9]	5.05	5.25	6.70
Chicago (w'hse)	4.85-5.05	5.75‡§	7.15	4.85	6.52-6.65	4.90	5.70	8.10[9]	4.90	5.10	6.55
Milwaukee (city)	5.38	6.08‡§	7.48	5.18	6.82-6.98	5.23	6.03	8.43[9]	5.23	5.43	6.88
St. Louis (del.)	5.34§	6.24§	7.44	5.34	6.64	5.39	6.19[12]	6.64	5.39	5.59	7.04
St. L. (w'hse).	5.19§	6.09§	7.29	5.19	6.49	5.24	6.04[13]	9.49	5.24	5.44	6.89
Birm'ham (city)	5.20§	...	6.60	5.20	...	5.15	6.66-6.83	...	5.15	5.40	7.41-7.73[24]
Birm'ham(c'try)	5.05§	...	6.45	5.05	...	5.00	6.51-6.68	...	5.00	5.25	7.26-7.58[24]
Omaha, Nebr...	6.07	...	9.33	6.07	...	6.12	6.92	...	6.12	6.32	7.77
Los Ang. (city)	6.55§	8.05	8.20†	6.75	9.50	6.20	8.00-8.50	...	6.70	6.40	8.15
L. A. (w'hse) .	6.40§	7.90	8.05†	6.60	9.35	6.05	7.85-8.35	...	6.55	6.25	8.00
San Francisco .	5.95[20]	7.15	8.05	6.75[21]	8.25[18]	5.90[20]	7.55	10.20‡‡	5.90	7.60	8.10
Seattle-Tacoma .	6.35[17]	7.90[8]	8.40	6.70[17]	...	6.20[17]	8.15[3]	9.45[3]	6.30[17]	6.35[17]	8.40[17]

Base Quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold finished bars, 1000 lb and over; galvanized sheets, 450 to 1499 lb; [1]—1500 lb and over; [2]—1000 to 4999 lb; [3]—450 to 39,999 lb; [4]—three to 24 bundles; [5]—450 to 1499 lb; [6]—400 to 1499 lb; [7]—1000 to 1999 lb; [11]—1000 to 39,999 lb; [12]—1000 lb and over; [13]—2000 lb and over; [17]—300 to 999 lb; [18]—1500 to 1999 lb; [19]—1500 to 39,999 lb; [20]—400 to 3999 lb; [21]—400 lb and over; [23]—500 to 1499 lb; [24]—Price (but not other price in range) applies to any and all quantities.

* Includes gage and coating extra, except Birmingham (coating extra excluded); † does not include gage extras; ‡ 15 gage; § 18 gage and heavier; ** as rolled; †† add 0.40 for sizes not rolled in Birmingham; ‡‡ top level of quoted range is nominal.

Bolts, Nuts

Prices to consumers, f.o.b. midwestern plants. Sellers reserve right to meet competitors' prices, if lower. Additional discounts on carriage and machine bolts, 5 for carloads; 15 for full containers, except tire and plow bolts.

Carriage and Machine Bolts

½-in. and smaller ; up to 6 in. in length.	35 off
⅝ and ¾ x 6-in. and shorter.....	37 off
⅞-in. and larger x 6-in. and shorter..	34 off
All diameters longer than 6-in.	30 off
Tire bolts	25 off
Plow bolts	47 off
Lag bolts, 6 in. and shorter	37 off
Lag bolts, longer than 6 in.	35 off

Stove Bolts

In packages, nuts separate, 58½-10 off; bulk 70 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

Nuts

Semifinished hexagon	A.S. Light	A.S. f.o.b. Reg. and Heavy
⅞-in. and smaller	41 off	.....
⅛-in. and smaller	.....	38 off
½-in.-1-in.	39 off	.....
1⅛-in.-1-in.	.....	37 off
1⅛-in.-1½-in.	37 off	35 off
1⅝-in. and larger	34 off	28 off

Additional discount of 15 for full containers.

Hexagon Cap Screws (Packaged)

Upset 1-in. smaller by 6-in. and shorter (1020 bright)	46 off
Upset (1035 heat treated) ⅝ and smaller x 6 and shorter....	40 off
¾, ⅞, & 1 x 6-in. and shorter.....	35 off

Square Head Set Screws

Upset 1-in. and smaller	51 off
Headless, ¼-in. and larger	31 off

Rivets

F.o.b. midwestern plants	
Structural ½-in. and larger	6.75c
⅞-in. and under	48 off

Washers, Wrought

F.o.b. shipping point, to jobbers..Net to $1 off

FERROALLOY PRODUCT PRICES

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si) Carlot per gross ton. $62, Palmerton, Pa.; $66, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $160 per gross ton of alloy, c.l., packed, $172; gross ton lots, packed, $187; less gross ton lots, packed, $204; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., or Welland, Ont. Base price; $165, Rockwood, Tenn.; $162, f.o.b. Birmingham and Johnstown, Pa., furnaces; $160, Sheridan, Pa.; $163, Aetna, Pa. Shipment from Pacific Coast warehouses by one seller add $31 to above prices, f.o.b. Los Angeles, San Francisco, Portland, Oreg. Shipment from Chicago warehouse, ton lots, $201; less gross ton lots, $218 f.o.b. Chicago. Add or subtract $2 for each 1%, or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Carload, lump, bulk, max. 0.10% C, 24.75c per lb of contained Mn, carload packed 25.5c, ton lot 26.6c, less ton 27.8c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 0.75% C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Carload, lump, bulk 18.15c per lb of contained Mn, carload packed 18.9c, ton lot 20.0c, less ton 21.2c, Delivered. Spot, add 0.25c.

Manganese Metal: (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Carload, 2" x D, packed 35.5c per lb of metal, ton lot 37c, less ton 39c. Delivered. Spot, add 2c.

Manganese, Electrolytic: Less than 250 lb, 35c; 250 lb to 1999 lb, 32c; 2000 to 35,999 lb, 30c; 36,000 lb or more, 28c. Premium for hydrogen-removed metal 1.5c per pound. F.o.b. cars Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 8.6c per lb of alloy, carload packed, 9.35c, ton lot 10.25c, less ton 11.25c. Freight allowed. For 2% C grade, Si 15-17.5%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 20.5c per lb of contained Cr, c.l., packed 21.4c, ton lot 22.55c, less ton 23.95c. Delivered. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Contract, c.l., 8MxD, bulk 22.0c per lb of contained Cr, c.l., packed 22.9c, ton 24.25c, less ton 26.0c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max. 0.03% C 31.85c per lb of contained Cr, 0.04% C 29.75c, 0.06% C 28.75c, 0.10% C 28.25c-28.5c, 0.15% C 28.0c, 0.20% C 27.75c, 0.50% C 27.5c, 1% C 27.25c, 1.50% C 27.1c, 2% C 27.0c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, C 0.75-1.25% max.). Contract, carload, lump, bulk 27.75c per lb of contained chromium, carload, packed 28.85c, ton lot 30.05c, less ton 31.85c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 5c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 5c for each 0.25% of N above 0.75%.

Chromium Metal: (Min. 97% Cr and 1% Fe). Contract, carload, 1" x D; packed, max. 0.50% C grade, $1.03 per lb of contained chromium, ton lot $1.05, less ton $1.07. Delivered. Spot, add 5c.

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Secondary Ingot Metal Prices Ease

Brass and bronze ingot and remelt aluminum ingot prices lowered by several producers due to weakness in scrap metals and decline in new business.

New York—Undertone of the secondary metal markets weakened last week, although major primary markets remained firm. Sellers in all branches of the nonferrous metal markets reported that buying pressure has eased, despite a continued shortage of primary metals. Offerings of refined copper, lead and zinc are not being made freely and consumers continue to get bulk of their needs on a quota basis. Weakness in the markets is not expected to spread much futher since the government is anxious to build up its permanent stockpile of strategic metals as rapidly as possible and will absorb quickly any tonnage made available.

The trend is considered a healthy market factor, since industry is establishing its buying policy on a more realistic basis than appeared at the year's end and when buyers were stampeding to get metals. Principal anxieties of the metal trade now are concentrated upon changes in credit situations. Many smaller metal buyers have become slow in payments, according to a leading metal seller.

Copper—Bookings continued light in the domestic market last week due in part to the fact that Kennecott Copper Corp.'s properties in Utah are still idle pending settlemeit of the strike. According to trade estimates, bookings for January delivery totaled about 100,000 tons.

Copper & Brass Ingots — The leading producer in the Philadelphia district made further sharp reductions in prices for brass ingots last week, due to the decline in scrap prices and the continued scarcity of new business. This company lowered its prices 1-cent a pound on ingot Nos. 115, 120 and 123 in the 85-5-5-5 group; ½-cent a pound on ingot. No. 245 (Navy M) and ½-cent a pound on yellow brass ingot No. 405.

Shipments of brass and bronze ingots declined to 20,954 tons in December from 21,731 tons in November, according to I. Glueck, secretary, Ingot Bass & Bronze Institute. Total shipments in 1948 amounted to 279,500 tons compared with 263,711 tons in 1947.

Secondary Aluminum — Prices on some of the secondary aluminum foundry alloys were reduced last week by some of the leading smelters, resulting in wide price spreads. The market is now quoted as follows: 95-5 alloy, 0.30 copper, 27.75c to 29.25c; 95-5 alloy, up to 0.60 copper, 27.25c to 28.75c; piston alloys, 6-6 type, 24.50c to 25.50c; No. 13 alloys, 28.00c to 29.25c; No. 356 alloy, 27.75c to 29.50c. Prices held steady on other grades.

Lead — Sellers have booked large tonnages of lead for February delivery and are now about 75 per cent covered for that month. Although some consumers, such as battery makers, are geting as much lead as they require, others are still attempting to get additional allotments. These requests generally have been rejected. Supplies for March are expected to be smaller than they will be for February.

Zinc — No letup in demand for zinc has been noted here. Producers still have no difficulty in disposing of their offerings, regardless of grades. Pressure for prompt shipment continues heavy. One of the factors in the supply situation is the continued shutdown of the American Zinc, Lead & Smelting Co.'s smelters at Fairmont City and Hillsboro, Ill., which have been strike-bound since Aug. 13, 1948.

Tin—Reconstruction Finance Corp. has purchased more than 12,000 tons of pig tin against its first interim allocations of 19,000 tons for the first half of 1949. Of the 12,000 tons, about 11,000 tons were guaranteed to be for Grade A quality and the balance, Grade B.

Platinum — The leading refiner of precious metals reduced its "official" price for platinum $5 per ounce on Jan. 24 to a range of $88 to $91. The 10 per cent iridio-platinum is now quoted $93 while ruthenium is quoted $88 to $91.

Copper Output Dips in 1948

Washington — Despite conditions favorable to maximum output of copper in the United States during most of 1948, mine production fell 49,000 tons below the anticipated practicable maximum of 875,000 short tons and was 3 per cent lower than in 1947, according to the Bureau of Mines. The work stoppages of locomotive workers at the Utah Copper mine of the Kennecott Copper Corp., Bingham Canyon, Utah, beginning Oct. 24 and continuing beyond the end of the year, was estimated to have been responsible for the loss of close to 50,000 tons and was virtually the only important factor to impede the obtaining of greater supplies from domestic mines. A similar strike at the same property in 1947 curtailed output about 13,000 tons in that year.

Output in 1948 was 826,000 tons, compared with 847,563 in 1947.

Industrial demand for copper continued at record peacetime levels and requirements for the government stockpile assured the absorption of excess supplies should any develop.

Bauxite Production Increases

Washington — Domestic mine production of bauxite established a new postwar record in the third quarter of 1948, according to the Bureau of Mines. Output totaling 446,146 long tons (dried equivalent), was a second successive increase of 21 per cent and the greatest for any three-month period since the fourth quarter of 1944. Over 96 per cent of the domestic production in the third period was furnished by mines in Arkansas.

Imports of bauxite also set a new high record in the third quarter by increasing 2 per cent over the previous quarter. Receipts from foreign sources together with domestic production brought the three-month total new supply to over 1 million tons for the first time in history. Surinam continued the leading exporter of bauxite to the United States, but Netherlands Indies showed the largest gain—132 per cent above its second quarter shipments.

Aluminum Product Sales Dip

Washington—Shipments of aluminum wrought products in November amounted to 130 million pounds, the lowest point of the year, according to the Bureau of the Census. They were 6 per cent below the 139 million pounds shipped during October and compared with 133 million pounds shipped in November, 1947. However, shipments for the first 11 months of 1948 at 1514 million pounds, were still 19 per cent higher than the 1269 million pounds shipped in the like 1947 period. The decrease in shipments during November was accounted for principally by decreased shipments of plate, sheet and strip, which totaled 99 million pounds, about 10 per cent lower than the 110 million pounds shipped in October.

Shipment of magnesium wrought products during November totaled 532,000 pounds, a slight increase over the 519,000 pounds shipped in October. Total for the first 11 months of 1948, at 5,144,000 pounds, were 13 per cent higher than the 4,532,000 pounds shipped in the like 1947 period.

Power Shortage Acute in West

Seattle — Continued cold weather and snow have emphasized the critical power shortage in the Pacific Northwest. The peak was expected Jan. 24, according to Bonneville power officials, following a drop in the Columbia river flow. At the same time the power pool load increased from 2,880,000 kw to 3,041,000 kw. In answer to a request for conservation, some industrial plants in this area curtailed operations last week and some unemployment resulted. In other plants, work hours have been shifted to reduce consumption at peak hours. The deficiency of the western section of the pool is 300,000 kw and to overcome this a general saving of 15 per cent is advocated by executives. Meanwhile storage reservoirs are furnishing sufficient water to temporarily overcome the shortage.

Private company officials have accused Bonneville Power Administration of over selling its capacity to aluminum plants and other industries, the charge being hotly refuted. Governor Arthur B. Lanhlie, Washington, states: "Our existing power production is over subscribed. We face a critical need for additional generating capacity. We challenged the East's bid for industrial expansion. Now we must intensify our preparation to take full advantage of this industrial influx."

NONFERROUS METAL PRICES

(Cents per pound, carlots, except as otherwise noted)

Copper: Electrolytic, 23.50c, Conn. Valley: Lake, 23.62½c, Conn. Valley.

Brass ingot: 85-5-5-5 (No. 115) 19.50-22.00c; 88-10-2 (No. 215) 31.00c; 80-10-10 (No. 305) 27.25c; No. 1 yellow (No. 405) 17.00-17.50c.

Zinc: Prime western 17.50c, brass special 17.75c, intermediate 18.00c, East St. Louis; high grade 18.50c, delivered.

Lead: Common 21.30-21.35c, chemical and corroding 21.40c, St. Louis.

Primary Aluminum: 99% plus, ingots 17.00c, pigs 16.00c. Base prices for 10,000 lb and over, f.o.b. shipping point.

Secondary Aluminum: Piston alloy (6-6 type) 24.50-25.50c; No. 12 foundry alloy (No. 2 grade) 24.00-24.50c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 26.75-27.25c; grade 2, 25.00-25.50c; grade 3, 24.00-24.50c; grade 4, 23.00-23.50c. Prices include freight at carload rate up to 75 cents per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb. and over, 20.50c, f.o.b. Freeport, Tex.

Tin: Grade A, 99.8% or higher (including Straits) $1.03; grade B, 99.8% or higher, not meeting specifications for grade A, with 0.05% max. arsenic, $1.028; grade C, 99.65-99.79%, incl., $1.024; 99.5-99.649% $1.024, grade F, 98-98.999% $1.015 for tin content. Prices are ex-dock, New York, in 5-ton lots.

Antimony: American 99-99.8% and over but not meeting specifications below, 38.50c; 99.8% and over (arsenic 0.05% max.; other impurities, 0.1% max.) 39.00c, f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 40.00c; 25-lb pigs, 42.50c; shot nom.; "XX" nickel shot, 43.50c; "F" nickel shot or ingots, for addition to cast iron, 40.50c. Prices include import duty.

Mercury: Open market, spot, New York $90-$97 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $24.50 per lb contained Be.

Cadmium: "Regular" straight or flat forms, $2 del.; special or patented shapes, $2.10.

Cobalt: 97-98%, $1.65 per lb for 550 lb (keg); $1.67 per lb for 100 lb (case); $1.72 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York, 70.00c per ounce.

Platinum: $88-$91 per ounce.

Palladium: $24 per troy ounce.

Iridium: $110-$115 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill)

Sheet: Copper 37.18; yellow brass 34.59; commercial bronze, 95%, 37.23; 90%, 36.88; red brass, 85%, 36.01; 80%, 35.66; best quality, 35.33; nickel silver, 18%, 46.92; phosphor-bronze, grade A, 5%, 56.05.

Rods: Copper, hot rolled 33.28; cold drawn 34.28; yellow brass, free cutting, 38.16; commercial bronze, 95% 36.92; 90% 36.57; red brass, 85% 35.70; 80% 35.35.

Seamless Tubing: Copper 37.22; yellow brass 37.60; commercial bronze 90% 39.54; red brass 85% 38.92; 80% 38.57.

Wire: Yellow brass 34.88; commercial bronze, 95% 37.52; 90% 37.17; red brass, 85% 36.30; 80% 35.95; best quality brass 35.62.

Copper Wire: Bare, soft, f.o.b. eastern mills, c.l. 29.42½c, l.c.l. 29.92½-30.05c; weather-proof, f.o.b. eastern mills, c.l. 29.60-29.85c, l.c.l. 30.35c; magnet, delivered, c.l. 32.75-33.50c, 15,000 lb or more 33.00-33.75c, l.c.l. 33.50-34.25c.

ALUMINUM

Sheets and Circles: 2S and 3S mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	26.9	...	...
0.135-0.096	12-48	27.4	...	...
0.095-0.077	12-48	27.9	26.0	29.6
0.076-0.068	12-48	28.5	26.2	29.8
0.067-0.061	12-48	28.5	26.2	29.8
0.060-0.048	12-48	28.7	26.4	30.1
0.047-0.038	12-48	29.1	26.6	30.4
0.037-0.030	12-48	29.5	27.0	30.9
0.029-0.024	12-48	29.9	27.3	31.3
0.023-0.019	12-36	30.5	27.7	31.8
0.018-0.017	12-36	31.1	28.3	32.6
0.016-0.015	12-36	31.8	28.9	33.5
0.014	12-24	32.7	29.7	34.6
0.013-0.012	12-24	33.6	30.4	35.5
0.011	12-24	34.6	31.3	36.7
0.010-0.0095	12-24	35.6	32.3	38.0
0.009-0.0085	12-20	36.8	33.4	39.5
0.008-0.0075	12-20	38.1	34.6	41.1
0.007	12-18	39.5	35.9	42.9
0.006	12-18	41.0	37.2	47.0

* Minimum length, 60 inches. † Maximum diameter, 24 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T4, 17S-T4	—Round— R317-T4	—Hexagonal— R317-T4, 17S-T4
0.125	48.0	...	...
0.156-0.203	41.0	...	...
0.219-0.313	38.0	...	...
0.344	37.0	...	47.0
0.375	36.5	45.5	44.0
0.406	36.5	...	...
0.438	36.5	45.5	44.0
0.469	36.5	...	...
0.500	36.5	45.5	44.0
0.531	36.5	...	...
0.563	36.5	...	41.5
0.594	36.5	...	...
0.625	36.5	43.0	41.5
0.656	36.5	...	...
0.688	36.5	...	41.5
0.750-1.000	35.5	40.5	39.0
1.063	35.5	...	37.5
1.125-1.500	34.5	39.0	37.5
1.563	34.5	...	37.5
1.625	33.5	...	36.5
1.688-2.000	33.5	...	...
2.125-2.500	32.5	...	...
2.625-3.375	31.5	...	...

LEAD

(Prices to jobbers, f.o.b. Cleveland, Pittsburgh) **Sheets:** Full rolls, 140 sq ft or more, $27.25 per cwt.; add 50c per cwt., 10 sq ft to 140 sq ft. **Pipe:** Full coils, $27.25 per cwt; cut coils, $27.50. **Traps and Bends:** List price plus 70%.

ZINC

Sheets, 22.00-22.50c, f.o.b. mill, 36,000 lb and over. Ribbon zinc in coils, 20.75-21.50c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 19.75-20.50c; over 12-in., 20.75-21.50c.

NICKEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled, 60.00c. Strip, cold-rolled 66.00c. Rods and shapes, 56.00c. Plates 58.00c. Seamless tubes, 89.00c.

MONEL

(Base prices, f.o.b. mill.)

Sheets, cold-rolled 47.00c; Strip, cold-rolled, 50.00c. Rods and shapes, 45.00c. Plates, 46.00c, Seamless tubes, 80.00c. Shot and blocks, 40.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.312 in. in diameter, less than 25 lb, 52.00-56.00c; 25 to 99 lb, 42.00-46.00c; 100 lb to 4000 lb., 35.00-36.00c.

DAILY PRICE RECORD

	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Dec. Avg.	23.50	21.325	17.50	103.00	17.00	38.50	40.00	70.00
Nov. Avg.	23.50	21.325	16.580	103.00	17.00	38.50	40.00	73.655
Jan. 3-27	23.50	21.30–21.35	17.50	103.00	17.00	38.50	40.00	70.00

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del. New York; Aluminum, primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery, unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

Plating Materials

Chromic Acid: 99.9%, flake, f.o.b. Philadelphia, carloads, 26.00c; 5 tons and over 26.50c; 1 to 5 tons, 27.00c; less than 1 ton, 27.50c.

Copper Anodes: Base, 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat untrimmed 33.84c; oval 33.34c; electrodeposited, 31.09c; cast, 30.12c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 46.00c, f.o.b. Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 16.00c; 1000 to 19,900 lb, 15.00c, f.o.b. Niagara Falls, N. Y.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 250 lb, 26.25c; over 250 lb, 25.25c, f.o.b. Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 56.00c; 10,000 to 30,000 lb. 57.00c; 3000 to 10,000 lb, 58.00c; 500 to 3000 lb, 59.00c; 100 to 500 lb, 61.00c; under 10 lb, 64.00c; f.o.b. Cleveland. Add 1 cent for rolled depolarized.

Nickel Chloride: 100-lb kegs, 26.50c; 275-lb, or 500-lb bbl, 24.50c, f.o.b. Cleveland, freight allowed on barrels, or 3 or more kegs.

Tin Anodes: Bar, 1000 lb and over 119.00c; 500 to 999 lb, 119.50c; 200 to 499 lb, 120.00c; less than 200 lb, 121.50c; ball, 1000 lb and over, 121.25c; 500 to 999 lb, 121.75c; 200 to 499 lb, 122.25c; less than 200 lb, 123.75c f.o.b. Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 71.8c; 100 or 300 lb drums only, 100 to 500 lb, 63.6c; 600 to 1900 lb. 61.2c; 2000 to 9900 lb, 59.4c. Prices f.o.b. Sewaren, N. J. Freight not exceeding St. Louis rate allowed.

Zinc Cyanide: 100-lb drums 39.25c, f.o.b. Cleveland; 39.00c, Detroit; 38.00c, f.o.b. Philadelphia.

Stannous Sulphate: Less than 2000 lb in 100 lb kegs, 100.00c, in 400 lb bbl, 99.00c; more than 2000 lb, in 100 lb kegs, 99.00c, in 400 lb bbl, 98.00c, f.o.b. Carteret, N. J.

Stannous Chloride (anhydrous): In 400 lb bbl, 97.00c; in 100 lb kegs, 98.00c, f.o.b. Carteret, N. J.

Scrap Metals

BRASS MILL ALLOWANCES

Prices in cents per pound for less than 15,000 lb f.o.b. shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	21.125	21.125	20.375
Yellow brass	18.875	18.625	18.125
Commercial Bronze			
95%	20.250	20.000	19.500
90%	20.125	19.875	19.375
Red brass			
85%	20.000	19.750	19.250
80%	19.875	19.625	19.125
Best Quality (71-79%)	19.750	19.500	19.000
Muntz Metal	18.250	18.000	17.500
Nickel, silver, 10%...	20.250	20.000	10.000
Phos. bronze, A.....	22.625	22.375	21.375
Naval brass	18.750	18.500	18.000
Manganese bronze ...	18.750	18.500	17.875

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, f.o.b. shipping point, carload lots)

No. 1 coppér 19.50-20.00, No. 2 copper 18.50-19.00, light copper 17.50-18.00, composition red brass 15.50-15.75, auto radiators 13.50-13.75, heavy yellow brass 12.00-12.25.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 20.50, No. 2 copper 19.50, light copper 18.50, refinery brass (60% copper), per dry copper content 18.25-18.50.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots or more)

Copper and Brass: Heavy copper and wire No. 1 18.50-19.00, No. 2 17.50-18.00, light copper 16.50-17.00, No. 1 composition turnings 13.50-13.75, mixed brass turnings 8.75-9.00, new brass clippings 15.75-16.25, No. 1 brass rod turnings 12.75-13.25, light brass 8.25-8.50, heavy yellow brass 10.50-10.75, new brass rod ends 13.25-13.75, auto radiators, unsweated 12.75-13.00, cocks and faucets 12.25-12.50, brass pipe 12.75-13.25.

Lead: Heavy 18.50-19.00, battery plates 11.00-11.50, linotype and stereotype 19.50-20.00, electrotype 18.50-19.00, mixed babbitt 19.50-20.00, solder joints, 23.00-24.00.

Zinc: Old zinc 9.50-10.00, new die cast scrap 9.50-10.00, old die cast scrap 6.00-6.50.

Tin: No. 1 pewter 65.00-67.00, block tin pipe 83.00-84.00, No. 1 babbitt 51.00-54.00, siphon tops 50.00-52.00.

Aluminum: Clippings 2S 15.50-16.00, old sheets 12.00-12.50, crankcase 12.00-12.50, borings and turnings 6.00-6.50, pistons, free of struts, 12.00-12.50.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

PITTSBURGH

No. 1 Hvy. Melt.	$41.00
No. 2 Hvy. Melt.	39.00-41.00
No. 1 Busheling	41.00
No. 1 Bundles	41.00
No. 2 Bundles	38.00-41.00
No. 3 Bundles	37.00-39.00
Machine Shop Turnings	36.00-37.00
Mixed Borings, Turnings	35.50-36.50
Short Shovel Turnings.	38.00
Cast Iron Borings	37.50-38.00
Bar Crops and Plate	46.00-47.00
Low Phos. Steel	45.00-47.00
Heavy Turnings	36.00-38.00

Cast Iron Grades§

No. 1 Cupola	54.00-56.00
Machinery Cast	63.00-66.00
Charging Box Cast	50.00-51.00
Heavy Breakable Cast.	49.00-50.00
Malleable	63.00-64.00
Brake Shoe	49.00-50.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	44.00
Axles	53.00-54.50
Rails, Rerolling	55.00-56.00
Rails, Random Lengths	52.00-53.00
Rails, 3 ft and under.	55.00-56.00
Rails, 18 in. and under	56.00-57.00
Railroad Specialties	54.00-55.50
Uncut Tires	54.00-55.00
Angles, Splice Bars	56.00-57.00

§ Nominal.

CLEVELAND

No. 1 Heavy Melt. Steel	$37.00-37.50
No. 2 Heavy Melt. Steel	37.00-37.50
No. 1 Busheling	37.00-37.50
Nos. 1 & 2 Bundles	37.00-37.50
Machine Shop Turnings	31.50-32.00
Mixed Borings, Turnings	33.50-34.00
Short Shovel Turnings	33.50-34.00
Cast Iron Borings	32.50-33.00
Bar Crops and Plate	43.00-44.00
Punchings & Plate Scrap	43.00-44.00
Heavy Turnings	37.00-37.50
Alloy Free Turnings	33.50-34.00
Cut Structurals	43.50-44.00

Cast Iron Grades

No. 1 Cupola	$60.00-61.00
Charging Box Cast	57.00-57.50
Stove Plate	57.00-57.50
Heavy Breakable Cast.	50.00-50.50
Unstripped Motor Blocks	50.00-50.50
Malleable	70.00-70.50
Brake Shoes	53.00-53.50
Clean Auto Cast	63.00-63.50
No. 1 Wheels	60.00-60.50
Burnt Cast	52.00-52.50

Railroad Scrap

No. 1 R.R. Heavy Melt	43.00-44.00
R.R. Malleable	72.00-73.00
Rails, Rerolling	60.00-66.00
Rails, Random Lengths	56.00-58.00
Rails, 3 ft and under.	60.00-62.00
Cast Steel	51.00-52.00
Railroad Specialties	52.00-53.00
Uncut Tires	50.00-52.00
Angles, Splice Bars	58.00-59.00

VALLEY

No. 1 Heavy Melt. Steel	$37.50-38.00
No. 2 Heavy Melt. Steel	37.50-38.00
No. 1 Bundles	37.50-38.00
Machine Shop Turnings	32.00-32.50
Short Shovel Turnings	35.00-36.00
Cast Iron Borings	33.50-34.50
Low Phos.	45.00-46.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.00-44.00

MANSFIELD

Machine Shop Turnings	$35.50-36.00
Short Shovel Turnings	37.50-38.00

CINCINNATI

No. 1 Heavy Melt. Steel	$34.00
No. 2 Heavy Melt. Steel	34.00
No. 1 Busheling	34.00
Nos. 1 & 2 Bundles	34.00
Machine Shop Turnings	29.00
Mixed Borings, Turnings	29.00
Short Shovel Turnings.	31.00
Cast Iron Borings	30.00

Cast Iron Grades

No. 1 Cupola Cast	53.00
Charging Box Cast	46.00
Heavy Breakable Cast.	45.00
Stove Plate	45.00
Unstripped Motor Blocks	43.00
Brake Shoes	43.00
Clean Auto Cast	58.00
Drop Broken Cast	57.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	38.00
R.R. Malleable	62.00
Rails, Rerolling	53.00
Rails, Random Lengths	48.00
Rails, 18 in. and under	55.00

DETROIT

(Brokers' buying prices, f.o.b. shipping point)

No. 1 Heavy Melt. Steel	$32.50-33.00
No. 1 Busheling	32.50-33.00
No. 1 Low-phos. Bundles	37.50-38.00
No. 2 Bundles	32.50-33.00
Machine Shop Turnings	26.50-27.00
Mixed Borings, Turnings	26.50-27.00
Short Shovel Turnings.	27.50-28.00
Cast Iron Borings	30.00-30.50
Punchings & Plate Scrap	39.50-40.00

Cast Iron Grades

No. 1 Cupola Cast	53.00-55.00
Heavy Breakable Cast.	48.00-50.00
Clean Auto Cast	53.00-55.00

BUFFALO

No. 1 Heavy Melt. Steel	$43.00-45.00
No. 2 Heavy Melt. Steel	39.50-40.00
No. 1 Busheling	39.50-40.00
Nos. 1 & 2 Bundles	39.50-40.00
Machine Shop Turnings	35.00-35.50
Mixed Borings, Turnings	35.00-35.50
Cast Iron Borings	35.50-36.00
Short Shovel Turnings.	35.00-35.50
Low Phos.	43.00-45.00

Cast Iron Grades

No. 1 Cupola	51.00-52.00
Mixed Cupola	48.00-50.00
Heavy Breakable Cast.	55.00-57.00
Malleable	70.00-75.00
Clean Auto Cast	65.00-66.00

Railroad Scrap

Rails, 3 ft. and under.	56.00-57.00
Railroad Specialties	54.00-55.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	$42.00
No. 2 Heavy Melt. Steel	39.50
No. 1 Busheling	39.50
Nos. 1 & 2 Bundles	39.50
No. 3 Bundles	nom.
Machine Shop Turnings	34.00-35.00
Mixed Borings, Turnings	34.00-35.00
Short Shovel Turnings.	36.00-37.00
Bar Crop and Plate	45.00-46.00
Punchings & Plate Scrap	45.00-46.00
Cut Structurals	45.00-46.00
Elec. Furnace Bundles.	43.00-44.00
Heavy Turnings	42.00-43.00
No. 1 Chemical Borings	nom.

Cast Iron Grades

No. 1 Cupola Cast	50.00
No. 1 Machinery Cast.	52.00
Charging Box Cast	49.00
Heavy Breakable Cast.	48.00
Unstripped Motor Blocks	47.50
Clean Auto Cast	50.00
No. 1 Wheels	56.00-57.00
Malleable	nom.

NEW YORK

(Brokers' buying prices f.o.b. shipping point)

No. 1 Heavy Melt. Steel	$36.00-36.50
No. 2 Heavy Melt. Steel	34.00
No. 1 Busheling	34.00
Nos. 1 & 2 Bundles	34.00
No. 3 Bundles	32.00
Machine Shop Turnings	29.00
Mixed Borings, Turnings	29.00
Short Shovel Turnings.	30.00
Punching & Plate Scrap	41.00-42.00
Cut Structurals	41.00-42.00
Elec. Furnace Bundles.	41.00-42.00

Cast Iron Grades

No. 1 Cupola Cast	49.00
Charging Box Cast	49.00
Heavy Breakable	40.00
Unstripped Motor Blocks	46.50
Malleable	66.00-67.00

BOSTON

(F.o.b. shipping point)

No. 1 Heavy Melt. Steel	$35.00
No. 2 Heavy Melt. Steel	31.90
No. 1 Bundles	31.90
No. 1 Busheling	31.90
Machine Shop Turnings	27.00-28.00
Mixed Borings, Turnings	27.00-28.00
Short Shovel Turnings.	29.00-30.00
Bar Crops and Plate	37.50-38.50
Punching & Plate Scrap	37.50-38.50
Chemical Borings	36.00-37.00

Cast Iron Grades

No. 1 Cupola Cast	55.00-56.00
Heavy Breakable Cast	49.00-50.00
Stove Plate	48.00-49.00
Unstripped Motor Blocks	46.00-48.00
Clean Auto Cast	50.00-52.00

CHICAGO

No. 1 Heavy Melt. Steel	$38.00-40.00*
No. 2 Heavy Melt. Steel	37.50-38.00*
No. 1 Bundles	38.00-40.00*
No. 2 Bundles	37.50-38.00*
No. 3 Bundles	37.50-38.00*
Machine Shop Turnings	31.50-32.00
Mixed Borings, Turnings	31.50-32.00*
Short Shovel Turnings.	34.50-35.00
Cast Iron Borings	33.50-34.00
Bar Crops and Plate	44.00-45.00
Punchings	44.00-45.00
Elec. Furnace Bundles.	40.00-41.00
Heavy Turnings	37.00-37.50
Cut Structurals	42.50-43.00

Cast Iron Grades

No. 1 Cupola Cast	45.00-50.00
Clean Auto Cast	45.00-50.00
No. 1 Wheels	50.00-55.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	39.00-42.00
Malleable	59.00-60.00
Rails, Rerolling	55.00-57.00
Rails, Random Lengths	44.00-45.00
Rails, 3 ft. and under.	50.00-51.00
Rails, 18 in. and under	53.00-54.00
Railroad Specialties	44.00-45.00
Angles, Splice Bars	49.00-51.00

* Nominal.

ST. LOUIS

No. 1 Heavy Melt. Steel	$40.00-41.00
No. 2 Heavy Melt. Steel	39.00-40.00
Machine Shop Turnings	30.00-31.00
Short Shovel Turnings.	32.00-33.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 Cupola Cast	50.00-52.00
Mixed Cast	48.00-49.00
Heavy Breakable Cast.	43.00-44.00
Brake Shoes	50.00-52.00
Clean Auto Cast	55.00-57.00
Burnt Cast	51.00-52.00

Railroad Scrap

R.R. Malleable	64.00-65.00
Rails, Rerolling	55.00-56.00
Rails, Random Lengths	48.00-49.00
Rails, 3 ft. and under.	53.00-54.00
Uncut Tires	44.00-45.00
Angles, Splice Bars	47.00-49.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	$35.00
No. 2 Heavy Melt. Steel	35.00
No. 1 Busheling	35.00
Nos. 1 & 2 Bundles	35.00
No. 3 Bundles	32.00
Long Turnings	30.00-32.00
Short Shovel Turnings.	30.00-31.00
Cast Iron Borings	28.50
Bar Crops and Plate	40.00-42.00
Cut Structurals	40.00

Cast Iron Grades

No. 1 Cupola Cast	60.00-62.00
Stove Plate	60.00-62.00
No. 1 Wheels	59.00-61.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	38.00
R.R. Malleable	nom.
Axles, Steel	64.00-65.00
Rails, Rerolling	58.00-59.00
Rails, Random Lengths	45.00-48.00
Rails, 3 ft. and under.	42.00-44.00
Angles and Splice Bars	40.00-42.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	*$27.50
No. 2 Heavy Melt. Steel	*27.50
No. 1 Busheling	*27.50
Nos. 1 & 2 Bundles	*27.50
No. 3 Bundles	*24.50
Machine Shop Turnings	*18.00
Bar Crops and Plate	*27.50
Cast Steel	*27.50
Alloy Free Turnings	*18.00
Cut Structurals	*27.50

Cast Iron Grades

No. 1 Cupola Cast	50.00-65.00

Railroad Scrap

No. 1 Heavy Melting	*28.50
Axles	*34.00
Rails, Random Lengths	*29.00

*F.o.b. California shipping point.

SEATTLE

No. 1 Heavy Melt. Steel	$29.00-30.00
No. 2 Heavy Melt. Steel	29.00-30.00
No. 1 Busheling	29.00-30.00
Nos. 1 & 2 Bundles	29.00-30.00
No. 3 Bundles	24.50
Machine Shop Turnings	21.00-22.50
Mixed Borings, Turnings	21.00-22.50
Punching & Plate Scrap	33.00
Cut Structurals	26.00-28.00

Cast Iron Grades

No. 1 Cupola Cast	45.00
Heavy Breakable Cast	35.00
Stove Plate	30.00
Unstripped Motor Blocks	32.50
Malleable	40.00
Brake Shoes	35.00
Clean Auto Cast	40.00
No. 1 Wheels	37.50-40.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	28.50
Railroad Malleable	30.00
Rails, Random Lengths	30.00-32.00
Angles and Splice Bars	28.50

LOS ANGELES

No. 1 Heavy Melt. Steel	$27.50
No. 2 Heavy Melt. Steel	27.50
Nos. 1 & 2 Bundles	27.50
Machine Shop Turnings	20.00
Mixed Borings, Turnings	15.50-16.00
Punchings & Plate Scrap	33.00-36.00

Cast Iron Grades

No. 1 Cupola Cast	$37.50-42.50

HAMILTON, ONT.

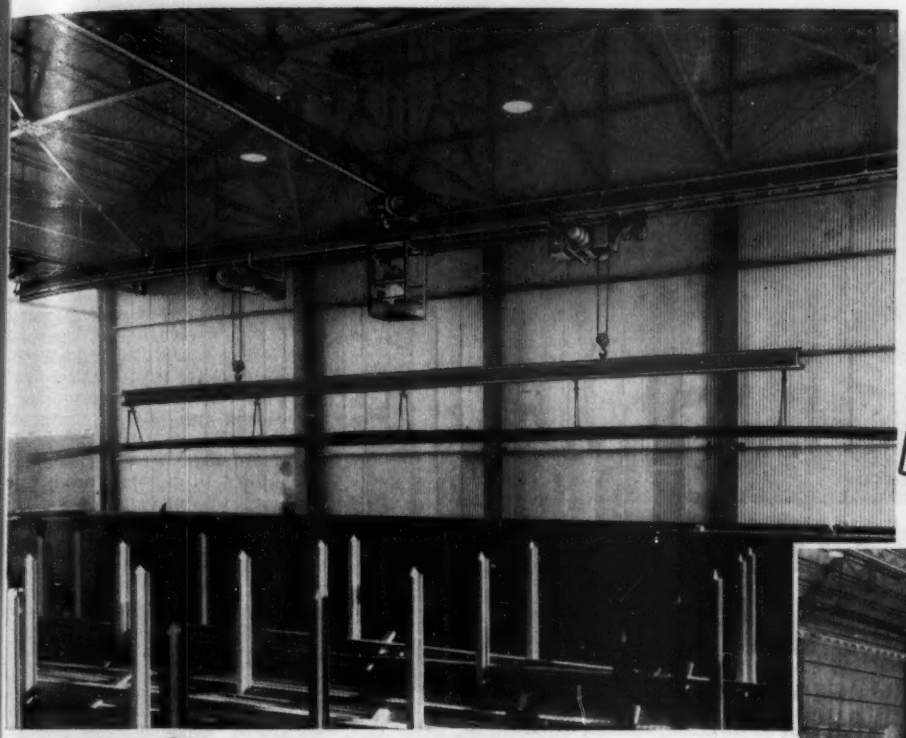
(Ceiling prices, delivered)

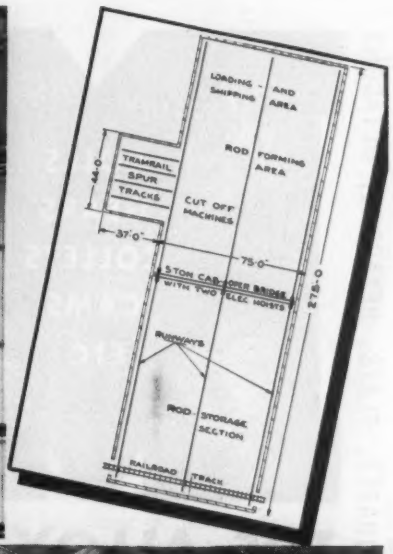
Heavy Melt.	$23.00
No. 1 Bundles	23.00
Mechanical Bundles	21.00
Mixed Steel Scrap	19.00
Mixed Borings, Turnings	17.00
Rails, Remelting	23.00
Rails, Rerolling	26.00
Bushelings	17.50
Bushelings, new factory, prep'd	21.00
Bushelings, new factory, unprep'd	16.00
Short Steel Turnings	17.00

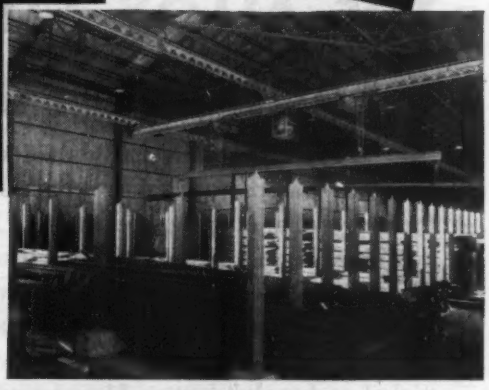
Cast Iron Grades*

No. 1 Cast	48.00
No. 2 Cast	44.00

* Removed from price control Aug. 9, 1947; quoted on basis of f.o.b. shipping point.







Handling bundles of reinforcing rod 65'0" long from gondola car to storage with cab-operated 5 ton Cleveland Tramrail bridge.

The rod is quickly and easily handled by the overhead bridge in and out of this efficient storage area designed by Southern States Steel Corporation engineers.

UNLOADS RAILROAD CARS IN 5% TIME FORMERLY REQUIRED

CONCRETE reinforcing rods are handled out of railroad cars at the modern plant of the Southern States Steel Corporation, Dallas, Texas, to storage by a Cleveland Tramrail cab-operated transfer bridge in one-twentieth of the time required by hand methods. Thus only three man-hours are now required to unload a car, whereas it formerly took 64 to 96 man-hours to do the job.

Not only is time saved in unloading the incoming rod, but equally large time savings are made in delivering rod from storage to cut-off machines and in loading shaped rods onto outgoing trucks.

The bridge which travels on a 3-track runway is completely motorized, cab-operated and of 5 tons capacity. It interlocks with 4 spur tracks at the cut-off machines where bundles of rod are lowered onto roller conveyors serving the machines.

The two hoists have a lift of 24 feet and are located on the bridge with the cab between. Rod up to 65'-0" long is handled by use of a lifting beam.

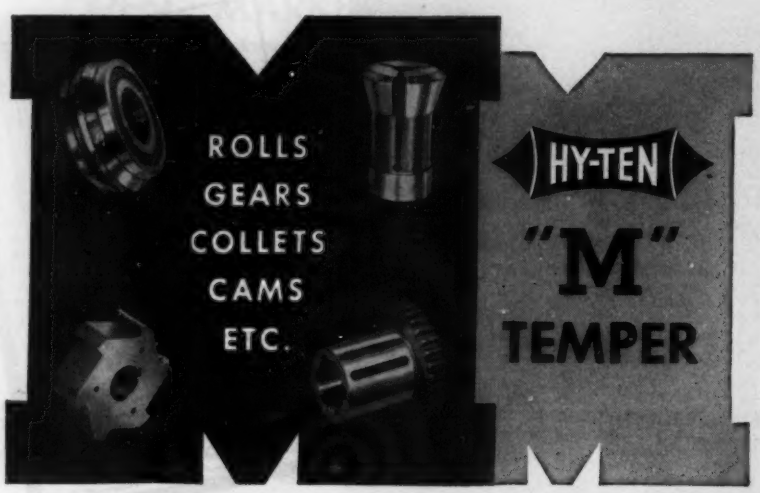
GET THIS BOOK!

BOOKLET No. 2008. Packed with valuable information. Profusely illustrated. Write for free copy

CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
7844 EAST 284th STREET, • WICKLIFFE, OHIO

CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT

OVER ONE HUNDRED YEARS OF CONTINUOUS SERVICE. ROUNDS, SQUARES, FLATS, HEXAGONS, OCTAGONS



BILLETS AND FORGINGS FOR PRODUCTION, TOOL ROOM AND MAINTENANCE REQUIREMENTS.

THE ALLOY STEEL THAT'S *MEANT FOR PUNISHMENT*

"M" TEMPER oil hardening steel was developed specifically for such vital, punishment-taking parts as dies, cams, collets, forming rolls, clutches, gears, etc. "M" TEMPER effectively combines high hardness with maximum toughness, minimum distortion, extreme density and great strength – properties that ideally combine to resist wear and breakage. This grade develops the advantages of the powerful alloys – chromium, nickel and molybdenum. Moreover, "M" TEMPER has excellent forging properties and is readily machinable in the annealed condition. Although low in cost, "M" TEMPER has non-deforming properties comparable to, and in many cases superior to, much more expensive steels.

WL *steels are metallurgically constant. This guarantees uniformity of chemistry, grain size, hardenability—thus eliminating costly changes in heat treating specifications.*

Write today for your FREE COPY of the Wheelock, Lovejoy Data Book. It contains complete technical information on grades, applications, physical properties, tests, heat treating, etc.

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HY-TEN and AISI

Sheets Strip . . .

Needs for major grades still exceed supply. Specialties are relatively easy

Sheet Prices, Page 104

New York — Demand for major grades of sheets continues active, notwithstanding falling off in specifications in some quarters. On hot and cold sheets, galvanized and enameling stock, overall needs still surpass supply. However, on some of the specialties, such as stainless and silicon sheets, requirements are definitely off and deliveries are relatively easy. Most producers can deliver stainless sheets within three to four weeks, although stainless strip schedules are more extended. In general, producers have little strip to offer for shipment before April. Silicon sheets can be had for almost prompt delivery in some instances. One eastern seller recently had available a carlot of electrical sheets in popular grades which he offered to three of his regular warehouse customers, without acceptance.

Electrical sheets which are now being offered for March delivery in certain instances were offered for no earlier delivery as far back as last fall. Some producers are now setting up quotas on a quarterly rather than a monthly basis; others are accepting tonnage almost as far ahead as consumers are willing to buy.

The situation continues somewhat mixed with respect to the setting up of quotas on hot and cold carbon sheets for shipment after the first quarter. No mill has set up quotas for the entire second quarter, but one important producer in the past few days has established allotments on both certified and non-certified tonnage for April.

Boston — Net effect of individual changes in flat-rolled demand is minor revisions in pattern of distribution without material influence on tonnage available under allocations.

Lower grades of electric sheets are showing some easiness and allocations for second quarter reflect new patterns. There is less price confusion in stainless with strip considerably tighter than sheets.

Philadelphia—Sheet consumers report mill tonnage about as difficult to get as ever, although considerably more tonnage is being offered them in the gray market at prices down substantially from where they were last fall. Apparently quite an effort is being made on the part of gray market sellers to "unload." Nevertheless, gray market prices are still well above the mill market and, in fact, above foreign offerings, which also are meeting with considerably less acceptance.

Cincinnati — Pressure for sheet deliveries is well sustained. Any holes in schedules resulting from easing in needs of some consumers are readily filled. Some of the clamor for deliveries are coming from those who are backing away from the gray market, seeking to switch to regular sources.

San Francisco — A few smaller users are showing tendency to order hand to mouth, but overall demand continues high and supplies are not sufficient to fill all requirements.

Government-Owned

aluminum plant

Burlington, N. J.

now for sale or lease

Financially and technically competent concerns prepared to operate an aluminum plant are invited now to enter bids for the purchase or lease of the Government-owned aluminum plant located at Burlington, New Jersey.

The plant, as originally designed, has a rated capacity of 108,000,000 pounds a year of aluminum and aluminum alloys. The plant site consists of about 69½ acres, and is well located with respect to markets and the handling of materials. As this property stands, it is approximately 65% intact. Any rehabilitation will consist of restoring the property to a sound and practicable operating condition.

TERMS: Outright sale will be on an "as is, where is" basis.

Offers for lease will be subject to the lessee's obligation of funds sufficient to re-equip and rehabilitate the plant for the production of aluminum pig or ingot, with the provision that no rentals shall accrue or be payable until such time as such rentals, if otherwise payable, would equal the amount of authorized expenditures made by the lessee and approved by the War Assets Administration or its successor agency.

Interested bidders will be given every opportunity to inspect this property and every co-operation in arriving at a decision. There is a brochure available which gives the plant and property layout, with illustrations and a general summary of its equipment content. The statements in the brochure with respect to equipment are subject to qualifications by actual inventory check and latest inventory statements.

NATIONAL SECURITY CLAUSE

The sale or lease of this property will be made subject to provisions of the National Security Clause whereby the Federal Government will retain dormant rights to utilize the facility for production under Government contract. In the event that this dormant right is exercised, the Federal Government will consider the qualifications of the buyer or lessee to carry out such contracts.

This facility is believed to be generally known to the aluminum and metallurgical industries; this advertisement is for the purpose of opening up one of the few remaining substantial opportunities in the field for operation by private enterprise.

SEALED BIDS

Sealed proposals for the purchase or lease of this property will be received at the address below until 2:00 P.M., E.S.T., March 2, 1949. For appointment to inspect the plant or to examine the available records, please write the address below or telephone REpublic 7500, Extension 3410.

WAR ASSETS ADMINISTRATION
OFFICE OF REAL PROPERTY DISPOSAL

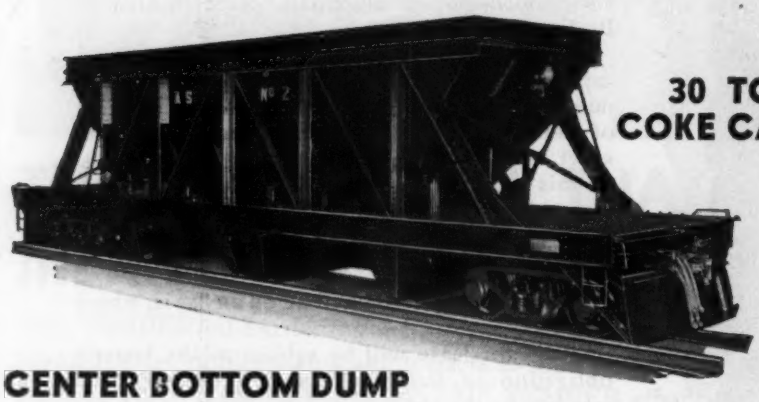
1666

ROOM 1406, TEMPORARY "I" BLDG. · WASHINGTON 25, D.C.

ATLAS

INTRAPLANT HAULAGE EQUIPMENT

SPEEDS PRODUCTIONS—LOWERS COSTS

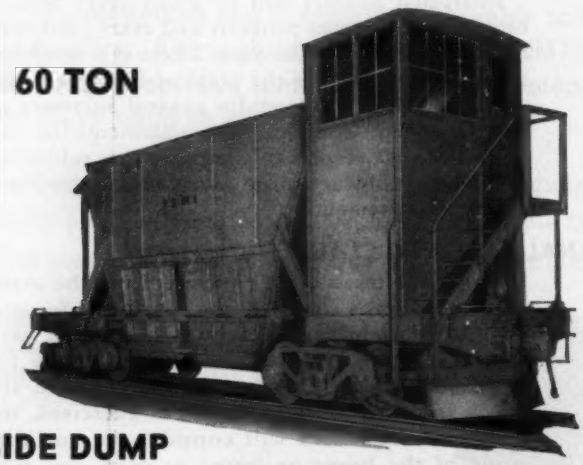


30 TON COKE CAR

CENTER BOTTOM DUMP

Trailer Type divided into two sections with rolling bottom dump gates controlled from locomotive cab. Car has self-aligning bearings, air brakes and standard safety equipment.

60 TON



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Steel Bars . . .

Two eastern cold finishers advance prices 3 to 5 cents per 100 pounds

Bar Prices, Page 104

Philadelphia — Two cold finishers of carbon bars in this district have advanced prices as a result of the recent application of the six per cent freight surcharge. The Camden cold drawer has advanced its f.o.b. mill price to $4.50, an increase of 5 cents per hundred pounds, and the Spring City, Pa., interest has advanced its price to $4.48, mill on deliveries in the Philadelphia district, an increase of 3 cents. Certain other eastern mills contemplate an increase to offset the higher freight charges on incoming hot-rolled tonnages, but have made no announcements so far.

While demand for cold-drawn carbon bars is easier, cold drawers having to rely upon other companies for their hot bar material report their major concern is in obtaining enough raw material to meet their needs. One such cold drawer is booked ahead solidly for three months on the basis of the hot bar tonnage definitely promised. Practically all sellers are out of the market for the remainder of the current quarter, barring some occasional spot openings which arise as a result of deferments or, in a few instances, cancellations.

Due to lessening activity in industrial construction, sash makers recently have not been taking in all the light bar shapes allotted. Tool steel demand still lags. Change in the aircraft program, with the emphasis shifting from jet planes to heavy bombers has caused a slackening in demand for aircraft quality alloy steels. Some district producers of heavy forgings have canceled semi-finished alloys of this character. However, as soon as the adjustment has been made requirements should pick up and likely be even heavier.

Boston — Demand for bars has slackened, chiefly in cold-drawn carbon and alloys. Where open tonnage has developed from cutbacks or suspensions, volume is usually disposed of without too much difficulty. Some forge shop tonnage has been cut back and an ominous note is in the reported cancellations by some textile mill equipment builders; one large shop lost domestic contracts reducing backlog from eight to five months. Bolt and nut requirements are less urgent and in making second quarter allocations a wider spread of tonnage involved is apparent; stainless bars are competitive with producers seeking orders. Carbon flats are in strong demand and warehouses who have become more conservative on cold-drawn intake are in want of flats.

New York — One eastern producer of hot carbon bars is offering more tonnage this quarter, but supply generally is as tight as ever. Various sellers are adhering strictly to original quotas which are smaller than for the preceding quarter. Cold-drawn carbon bar shipments are a little easier. Extra tonnage is snapped up quickly, generally when made available but the overall pressure has eased. Jobbers' stocks are in fair balance. Most cold drawers are booked well into

next quarter, except for spot openings due to deferments and, in a few instances, to cancellations.

Pittsburgh—Cold-finished bar output remains limited by continued shortage of hot-rolled carbon and alloy bars. With some mill allotment schedules extending into the second quarter cold finishers contend there is no indication of improvement in steel supply. Reflecting production schedules and continued heavy demand, some cold finishers' order books are extended into the fourth quarter. Influx of new orders remains generally unchanged with a slight easing in demand from the machine tool and bicycle industries being offset by heavier requirements elsewhere.

Cleveland — Demand for cold-finished bars continues in excess of supply, although producers are receiving an increasing number of instructions to delay shipments. Set-backs range from 30 to 90 days. One cold finisher, whose supplies of hot bars have been rather meager, reported a substantial improvement last week in receipts. If this higher level of receipts continues while metalworking plants set back orders, this cold finisher soon will have supply of cold bars in balance with demand. Noticeable among those asking that shipments be delayed are screw machine product makers. Tonnage delayed is being diverted to warehouses. Reflecting a difference in availability of mill supplies of hot bars, the shortage of cold-reduced bar flats is more severe than that of rounds.

Wire . . .

Wire Prices, Page 105

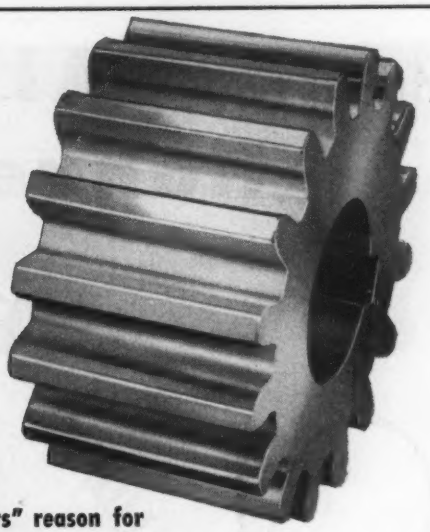
Pittsburgh — Jones & Laughlin Steel Corp. advanced galvanized wire product prices, effective Jan. 26, to offset higher zinc costs. Galvanizing extras on nails were raised 25 cents to $3.05 per 100 pounds for 15 gage and heavier, and like amount to $3.55 for lighter than 15 gage, in straight or mixed carloads. Galvanized barbed wire was advanced $3 per ton or 3 columns to column 126; woven fence a like amount as follows: 9 gage, to column 122; 11 and 12-1/2 gage, column 117; 14-1/2 gage, column 112. Merchant quality galvanized wire, 6 to 8 gage, was raised 15 cents to $5.40 per 100 pounds; manufacturing grades up proportionately.

Boston — Incoming volume of wire orders has slackened, accompanied by cutbacks and delivery suspensions. This means revisions in distribution and in some cases freed tonnage is not too easily shunted to other consumers. Rope and upholstery spring wire is slow with some easing in clock spring wire. Among the few grades showing a reverse trend is aircraft wire and a few specialties.

Cleveland — Demand for merchant wire products is well sustained, with nails and barb wire in tight supply. Slightly easier than those two products, but still tight, is woven fencing. Demand for tacks has eased, reflecting a decline in ordering by furniture makers.

San Francisco — Demand for most wire products has shown a seasonal decline. Supplies of wire products are easily available in most items.

Ampco Bronze Gears



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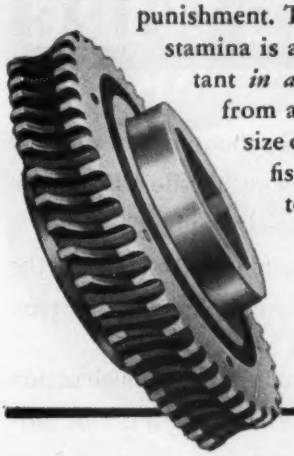
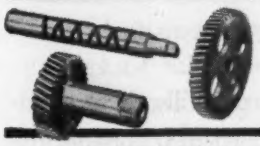
Whether you are designing a new gear or rebuilding old equipment, play safe by selecting the Ampco alloy and form that fit your needs. Get a gear that stands up under impact and fatigue with unbelievable resistance to wear—that outlasts any gear on the same job. Ask your nearest Ampco Field Engineer for recommendations and assistance.



SAND-CAST AMPCO METAL—Massive 2416 lb. worm gear which plays a critical part in the "screw-down" mechanism of a giant size rolling mill.

CENTRIFUGAL CASTING (including teeth)—Used as a boom hoist gear on large excavating shovel. Withstands wear, fatigue, shock, and abrasion caused by dust, dirt, and loading.



EXTRUDED AMPCO METAL—Tiny drive-gears and level-wind gears for a fishing reel; designed to give perfect performance and service under widely varied conditions.

WELDED ASSEMBLY — An Ampco centrifugally-cast ring welded to a mild steel hub and web with Ampco-Trode 10.

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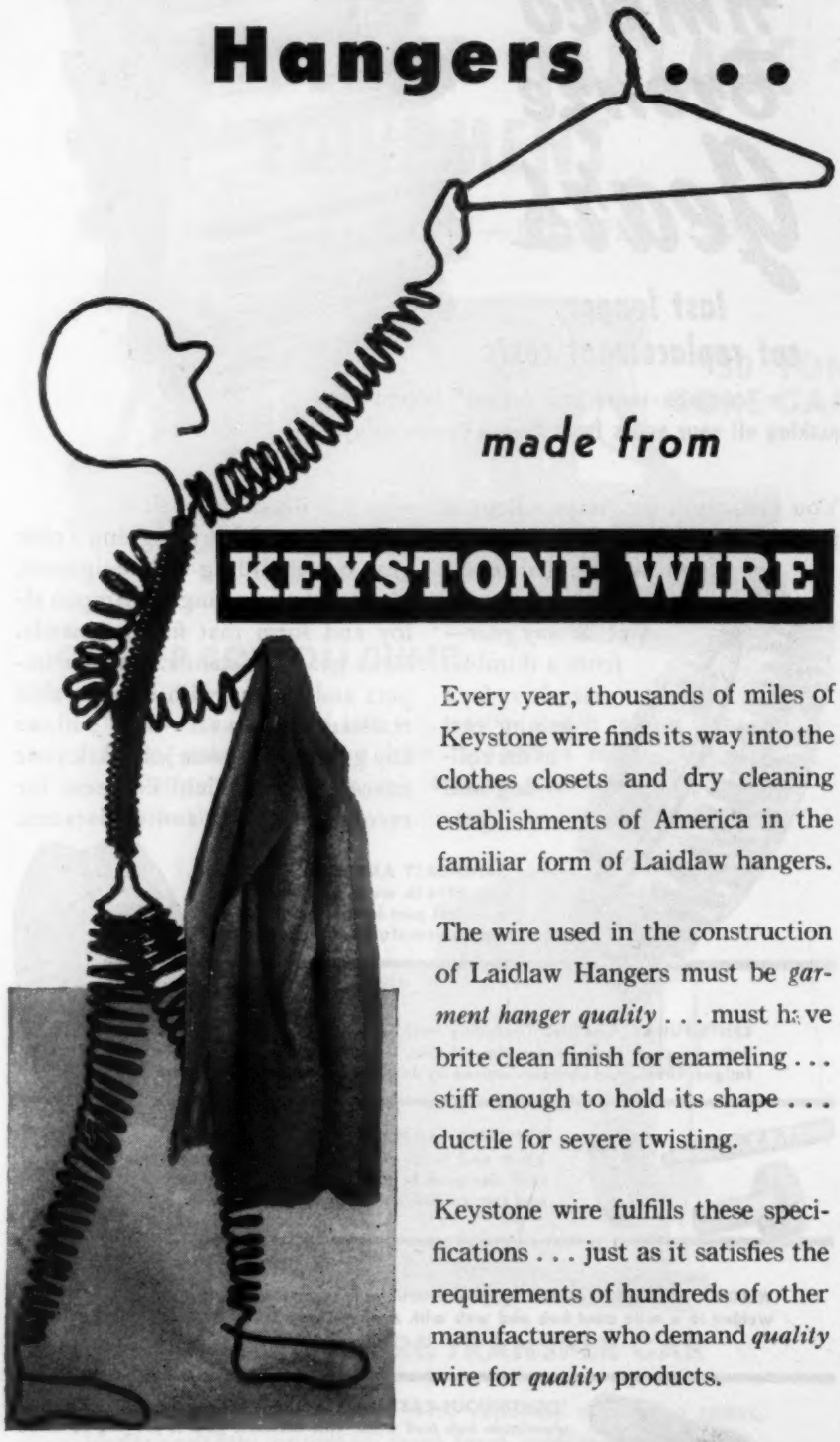

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Plates . . .

Plate Prices, Page 105

New York—Plates continue among the more stringent items. Consumers complain of difficulty in obtaining adequate supplies from the mills and assert that jobbers have little to offer. Gray market tonnage is available at 7.00c and 8.00c a pound, but consumers show little interest in premium-priced offerings.

Producers generally have not opened books for second quarter, although one leading mill recently set up quotas for April on certified tonnage and one or two others are about to do it. Quotas on certified work for beyond April probably would be set up were it clear as to how much this tonnage will be increased, if any.

An estimated 615,000 tons of plates will be required for a 30-inch, 1800-mile main gas line to be constructed from McAllen, Tex., to New York city, for the Transcontinental Pipe Line Corp. In addition, a substantial tonnage will be required for about 400 miles of laterals. General contract was let recently to Fish Engineering Corp., Houston, Tex., with construction scheduled to start on Apr. 1 at Jennings, La. The line will be fabricated by Consolidated Western Steel Corp., Los Angeles.

Philadelphia — While overall requirements exceed supply, soft spots in plate demand include trucks, house heating, boilers and tanks for fuel oil distributors and domestic consumers. Lag in tanks is ascribed as partly seasonal. Needs of independent distributors are beginning to get caught up; as for domestic tanks, the lag in housing construction is having an effect. On the other hand, there is strong pressure for steel for storage tanks from oil producers to handle the current heavy output, with agitation still going on for a special voluntary allotment of steel for this purpose. Fabricators of large tanks, with long term contracts, are also still scrambling for plates. However, if they were to receive an adequate amount of plates, backlogs, which in some cases extend more than a year, would shrink rapidly.

Truck requirements and those of motor buses and the like continue to decline. Employment of one district truck builder is now only 25 per cent of what it was some months ago.

On the whole, plate demand is still highly active, with considerable tonnage going into construction and maintenance, freight cars, heavy pipe, special equipment and a diversity of uses. Jobbers claim they cannot get nearly enough plate tonnage and, even in some lines in which there is currently a lag, a substantial tonnage is still being consumed. New construction requirements have leveled off some, but remain heavy.

San Francisco—Heavy demand continues to characterize the plate market. Supplies are affected by channeling of large amounts to large-diameter pipe fabrication.

Seattle — Scarcity of plates is reflected in lowered shop operations, one plant reporting no current backlog against one of six months a year ago. Several attractive pipe jobs have been lost through inability to obtain materials. Mills offer no immediate prospects of improvement.

Shot and Grit Prices Weaken

REDUCED foundry operations have cut demand for metallic shot and grit cleaning abrasives 20 to 40 per cent. Due to reduced demand and declining prices of ferrous scrap from which abrasives are produced, some producers have cut shot and grit prices from $5 to $10 a ton.

Resistance to immediate price reduction, however, stems from some relatively large inventories of scrap purchased at high prices and from inventories of the finished products made from the high-price scrap.

One important producer is still quoting carload lot prices of shot at $117 a ton and grit at $125 a ton.

Tin Plate . . .

Tin Plate Prices, Page 105

Pittsburgh—Demand for prime tin mill products shows no sign of easing, with some sellers anticipating another record output this year. However, a few small consumers are more inventory conscious and some resistance has been noted in moving off-grade "excess" tonnage. Less urgent demand for tin mill products is most pronounced in black plate "rejects." This product was advanced $9.50 a ton to $77 Jan. 1. Some warehouse interests report difficulty in moving this item. No sales resistance has been encountered to date in the sale of tin plate waste wasters, despite the Jan. 1 price advance from $3.70 to $4.25 per 100 pounds. No relief from present tin coating regulations is indicated until the last half of 1949 at the earliest. At that time, it is expected that restrictions will be modified.

Structural Shapes . . .

Structural Shape Prices, Page 105

Boston — Several structural steel contracts have been awarded on a delivery rather than price basis; deliveries range from five to six months on medium-tonnage projects. Bridge in Maine promised for July was awarded on that delivery.

Philadelphia — American Bridge Co., Pittsburgh, was low bidder on about 37,000 tons of steel for the Delaware River Memorial bridge, near Wilmington, comprising about 32,000 tons of structural steel, 4000 tons of cable and suspension rope and several hundred tons of grating, pipe railing, etc. Three contracts were involved, with one covering 17,410 tons of towers and suspension steel work on which American Bridge bid $6,119,300 and Bethlehem Steel Co., the only other bidder, $6,617,562. Another covered 15,225 tons of superstructure, on which American bid $5,299,800 and Bethlehem $5,402,011 while the third contract covered about 4000 tons of cables and suspension rope, on which American bid $2,311,485 and John A. Roebling's Sons Co., $3,314,113, the difference amounting to about $1 million.

Washington — General contractors' bids have just closed on the construction of a building for the Federal Accounting Offices, this city, requiring about 8000 tons of reinforcing steel and 1500 tons of shapes.

This 16" x 10" Reel Block being driven through a Horsburgh & Scott speed reducer is just one of many different types of machines and operations in steel mills where H & S has supplied equipment for transmitting power. For over fifty years H & S has furnished gears and speed reducers to the steel industry . . . designing and producing equipment that is accurate, dependable, efficient . . . built to endure.

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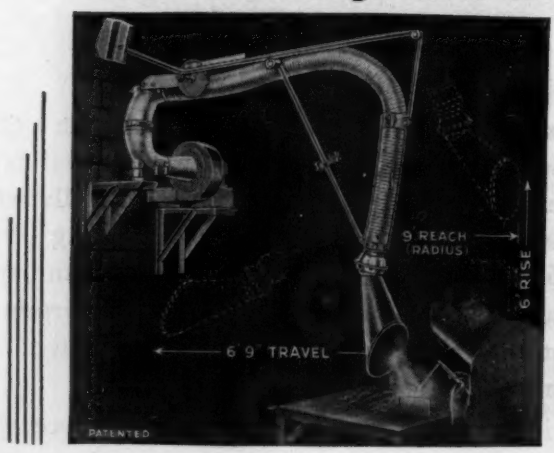

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MANUFACTURERS AND ENGINEERS — SAND BLAST AND DUST COLLECTING EQUIPMENT — WELDING FUME COLLECTORS

Basic Refractories Expands

Cleveland—Basic Refractories Inc. has purchased an extensive deposit of magnesite in the Paradise Mountain range of Nye county, Nevada, from the War Assets Administration. An adjacent ore dressing and calcining plant and also a large rotary kiln and accessories from the government-owned alumina plant at Baton Rouge, La., were involved in the purchase. This will permit an increase of about 50 per cent in the company's sales of magnesite refractories. The ore processing plant was operated for the government during the war by a former subsidiary of Basic Refractories, Basic Magnesium Inc., to produce magnesium metal. The Nevada production of refractories is expected to commence by July 1, at which time the company will occupy the unique position of producing a complete line of basic granular refractories.

Conversion plans for the new Nevada plant provide for the addition of a second rotary kiln at a later date.

Besides the purchase, the transaction with WAA embraces the lease of utility systems and a town that were constructed by the government to accommodate operating personnel.

Property purchased and leased consists of 45 lode-mining claims comprising approximately 800 acres, 10 mill-site claims totaling 50 acres, and 39 placer claims aggregating 4000 acres.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 106

Pittsburgh — Oven coke demand continues heavy for blast furnace and cupola use and in excess of supply. Some beehive coke operators lack sufficient orders to sustain full production schedules, reflecting a sharp reduction in production by jobbing foundries. No weakness has developed in foundry coke prices.

Cleveland—Despite the decline in foundry business, the demand for metallurgical coke is holding up well, although some soft spots are noticed. Delivered prices are now reflecting the recent increase in rail freight rates.

Iron Ore . . .

Iron Ore Prices, Page 106

Cleveland—Consumption of Lake Superior iron ore eased slightly in 1948 to 80,504,215 tons from 80,806,627 tons in 1947, according to the Lake Superior Iron Ore Association, this city. Of these totals, the United States accounted for 77,611,343 and 77,977,812 tons, respectively. Consumption in the United States totaled 7,125,104 tons in December compared with the corrected totals of 6,849,577 tons in November and 7,029,976 tons in October.

Blast furnaces depending principally on Lake Superior iron ore operating as of Jan. 1 totaled 177 in the United States against 171 as of Dec. 1; in Canada, 9 against 8. Only 8 blast furnaces were idle in the United States as of Jan. 1, compared with 14 as of Dec. 1 and being the lowest recorded since Dec. 1, 1947.

Total stocks of iron ore as of Jan. 1 amounted to 39,460,497 tons.

Pig Iron . . .

Pig Iron Prices, Page 106

Boston — Except for about half dozen larger melters, who are calling in more patterns from subcontract shops, pig iron melt is well below peak; even this group is reducing overtime and cutting corners. More users are increasing ratio of pig iron in melts which is showing up in fewer rejections and better castings. Some are drawing on foreign iron stocks for this; delivery on much of this imported iron was made in October, costing up to $90 per ton, and this iron is being worked off now. There are scattered suspensions of shipments and currently pressure is down. Arrangement by which consumers of basic are securing tonnage iron from one upper New York furnace expires in May; this involves the Republic-Kaiser controversy over a Buffalo furnace operation. For a run of basic, Mystic would need to stock 15,000 tons of foundry for the fill-in period and while there is some pressure for this, doubt exists as to whether or not the Everett furnace can build up such a reserve.

New York — Differential between foundry scrap and pig iron is narrowing rapidly, but scrap is still higher than pig iron. Whether the normal relationship, with scrap $2 to $3 below pig iron, will be restored soon, remains to be seen.

Notwithstanding restricted melting operations, particularly at the jobbing foundries, demand for domestic pig iron continues to hold up well, due to price advantage and the better quality of castings that can be made with a higher ratio of pig iron in the mix. Interest in premium iron, such as foreign iron, is lagging considerably. Some importers are still quoting around $70 to $72 c.i.f. on small lots and around $65 and less on round tonnages, but are selling very little.

Philadelphia—Pig iron demand is brisk despite the fact prices on pig iron and scrap for foundry consumption are now practically in balance, with the possibility that shortly the normal relationship, wherein cast holds at $2 to $3 a ton under iron, will soon be restored for the first time in years. This readjustment comes as a result of the sharp weakness in cast grades over recent weeks.

Continued strong pressure for iron, although not as urgent as a few weeks back, comes as a result of the desire of melters to increase the iron in their mix to a more normal ratio and thus get out better iron and enhance their competitive position. This comes even though demand for castings, iron castings in particular, continues to lag.

In general, the lull has hit the newer foundries much harder than the older established plants. But even some of the older establishments are hard hit in certain lines, especially in soil pipe. Jobbing foundries, both old and new, have been affected rather sharply as considerable subcontracting has been withdrawn. Foundry operations in this district, however, are at an average of four days a week.

Due to heavier demands for hot metal by its affiliated producer of steel, one district producer of pig iron recently curtailed its voluntary allocations of foundry iron and will also apply this reduced schedule of shipments to February as well.

Pittsburgh—Despite a slackening in demand from small jobbing foundries, current supply of merchant iron continues to fall short of the district's requirements. One interest has been able to augment his inventories through purchase of about one month's supply of foreign pig iron. However, this is the only purchase of this character reported among foundries here. There is a strong possibility that additional basic iron will be made available for the open market from an integrated producer, and iron from other areas may be offered here before the end of the year. The current price differential between pig iron and cast scrap, although narrowed in recent weeks, remains an important factor in bolstering demand.

Cleveland—Because of a decline in their business, some foundries are requesting that pig iron shipments to them be delayed. However, demand for iron is still great enough that sellers find no difficulty in diverting tonnages to fill other orders.

Delivered prices are now reflecting the recent increase in railroad freight rates.

As a result of the decline in ferrous scrap prices, Republic Steel Corp., whose pig iron prices at Buf-

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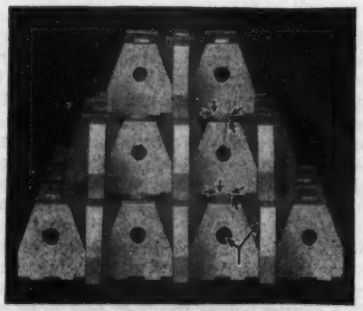

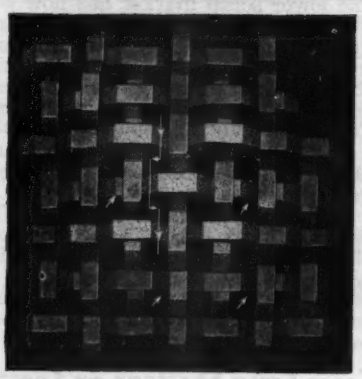

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falo have been keyed to the price of No. 1 heavy melting steel scrap has reduced them to those of other producers in the area, $47 a ton for basic and No. 2 foundry and $47.50 for malleable.

Buffalo — While demand for merchant iron continues to absorb capacity production, sellers are forced to revise delivery schedules to take up gaps left by lighter melts at several foundries. A bit of surprise was noted as malleable operations among midstate foundries were cut. Motor casters curtailed melt when a leading truck producer was reported operating on a reduced basis.

Chicago — Foundry operations will have to be cut back more than they have been before the iron situation eases appreciably, according to iron sellers. Instances where foundries are operating on a three-day week are rare and the tonnage that has been canceled on this account is small. Reinstatement of old quotas to customers when an independent furnace came back in blast recently led to reports that the situation was not as tight as formerly, but this seems to have been discounted. Even with cast scrap prices falling, nearly all melters would find it more profitable to use a larger proportion of iron if it were available. The iron-scrap ratio has been increased in some instances but still remains well below common practice before iron became critically short. Iron is not so scarce, however, that a big demand exists for foreign or out-of-the-district premium material.

St. Louis—In contrast to softening signs the past several weeks, pressure for pig iron is increasing. Producers attribute it to an attempt by steel mills to further weaken the scrap market and to restoration of orders by a few foundries which anticipate an early end to their seasonal production slumps. Also some foundries supplying stove manufacturers have turned to general jobbing work. There have been others who curtailed simply because they could not pay high materials costs. The lower scrap market has now put some of these back in business and they are reinstating pig iron orders. Overall, the pressure for iron is much stronger than a month ago. It is expected to continue at least through February, if for no other reason than a 10 per cent reduction in output and allocations because of the short month.

Dallas, Tex. — Lone Star Steel Co. denies rumors that it has made any change recently in its pig iron price schedule. The company continues to quote on the basis of $75 per gross ton, furnace, for No. 2 foundry iron, low phosphorus southern grade.

Fears Scrap Shortage on Coast

Seattle — F. B. DeLong, vice president in charge of sales of the Columbia Steel Co., told the Seattle Chamber of Commerce that the Pacific Coast steel industry faces a critical shortage in scrap this year because of the end of the ship breaking program. He warned that western mills will require more scrap in 1949 than heretofore, predicting that the industry as a whole will set a new record this year by shipping 68 million tons of finished steel.

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Scrap . . .

Scrap Prices, Page 110

Philadelphia—Buying of steel mill scrap is light, with various brokers having virtually no new orders to work on at the moment. In fact, one large seller is confronted far more at this time with cancellations of unfilled contracts than he is with new orders.

Steel mills throughout the country are estimated to have more than 1 million tons of scrap on hand than this time a year ago and this is reflected in the attitude of local district mills, some of whom also have a substantial cushion in the way of receipts of imported tonnage. The largest eastern consumer is receiving foreign shipments steadily and, as was the case a month ago, still has more than 100,000 tons of scrap on the high seas.

Some No. 1 heavy melting steel tonnage has been sold at $42 delivered, down $1, with the market on this grade still weak. No recent transactions have been reported in No. 2 heavy melting steel or the other major grades of open-hearth scrap which continues nominally at $39.50 delivered. However, it would not prove surprising if the next transactions would materialize at $2 or more down from the present nominal level.

Machine shop turnings, mixed borings and turnings and short shovel turnings are fairly steady in price, but the major low phos grades are off $1 a ton on light trading. Thus, bar crops and plate, punchings and plate scrap and cut structurals are now holding at $45 to $46 delivered. Electric furnace bundles also are off $1 to $43 to $44 and heavy turning to $42 to $43.

The major cast grades continue to tumble, with No. 1 cupola cast, $50; No. 1 machine cast, $52; charging box, $49; and heavy breakable, $48. Unstripped motor blocks are down to $47.50; clean auto cast, $50; and No. 1 wheels, $56 to $57. Some of these prices are nominal and represent more what sellers are willing to take, than what has actually been involved in sales.

Washington — Shpments of scrap from Germany to the United States in December amounted to 105,524 tons, an increase of about 25 per cent over November shipments.

December shipments included 21,560 tons of Army generated scrap and 83,964 tons of commercial scrap. Total shipments of scrap from Germany to the United States through December amounted to 353,766 tons. All but 4000 tons of this amount were shipped in the last six months of the year.

Buffalo — While leading mill consumers remained on the sidelines last week, scrap prices continued to skid as dealers willingly lowered offering prices. A real test of prices is expected this week when dealers will endeavor to negotiate new contracts as present orders expire. Buying support last week was virtually nil. Declines on No. 1 heavy melting steel were extended $1 to $2 to a range of $43 to $45. Another 50 cents was knocked off No. 2 material, which was quoted at $39.50 to $40. No sales were reported, but dealers said scrap was available at these levels. One negligible sale at $39.75 for No. 2 steel took place, but it was too small to really establish a market.

Drastic weakness swept the cast market with prices plunging up to $7 a ton. No. 1 machinery was quoted nominally at $50 to $52, while mixed material was down to $48.

Cleveland — Little activity prevailed in the scrap market here last week and prices on some grades continued to show downward tendencies. Steel mills generally had remained out of the market in January. It was believed that if they did not come into the market in early February their reduced inventories would necessitate entrance by Mar. 1. To guard against declines, most buyers who have come into the market recently have been buying for delivery within a 10-day period rather than 30 days.

Demand for cast scrap continues weak and prices on some grades have declined further. One foundry reported it is out of the scrap market for the first quarter.

Detroit — First pronounced bearish turn in scrap in many years developed last week, with open-hearth grades off $5 per ton, along with borings and turnings. No. 1 low-phosphorus bundles, sold to electric furnace melters, hold at a higher level, $37.50-$38, while low-phos plate scrap is off $3 per ton at $40 maximum. End of the month saw a cleanup of old orders at higher price levels, followed by the price break which is more severe here than in Pittsburgh or Youngstown, because of the heavy

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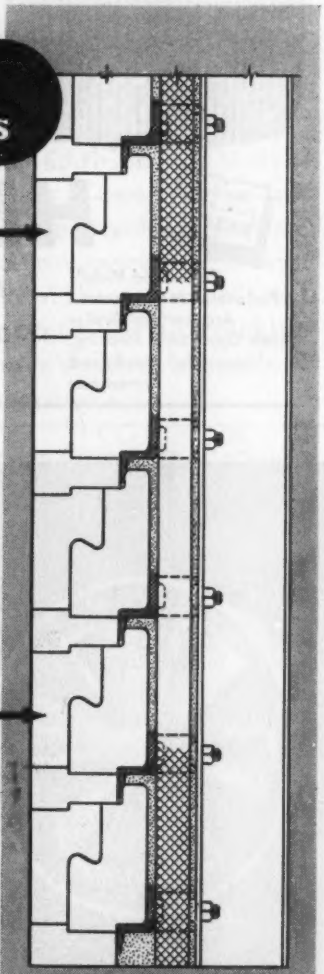

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freight differentials and the fact the Detroit area is a plus market. Local mills need only pay a little more than the Pittsburgh price, less freight from Detroit to Pittsburgh, to keep scrap from moving out. Even so, there is only mild interest in buying and a further slip in prices is expected. Reports that some outside mills have abandoned the practice of "earmarking" turnings and bundles for February suggest an early stop to this unhealthy practice on all grades of scrap and a return of prices to a true reflection of supply and demand. Cast scrap tobogganed finally as expected and, although No. 1 cupola material is quoted $10 a ton lower at $53 to $55, some brokers expect it to dip further, at least to the current price of foundry pig iron.

Pittsburgh — Softness in scrap quotations continues, although leveling off at slightly lower levels appears in the offing. Steel producers are aware that too sharp a drop in prices will have a tendency to dry up sources from remote points and also discourage efforts by peddlers. A major consumer recently purchased No. 2 heavy melting dealer scrap at $39, No. 2 bundles at $38 and mixed borings and turnings at $35.50. Same interest is attempting to establish a price differential of $1 between No. 1 heavy melting and No. 1 bushveling. Until the market settles down, however, there is little prospect that desired price differentials as to openhearth grades or between dealer and industrial scrap will be established on a firm basis. Since bulk of No. 1 heavy melting steel is moving at $41 from industrial sources, with $43 contract shipments generally completed, the price spread of $41-$43 is no longer applicable. Only significant purchase of cast scrap reported for February delivery was machinery grade at $65. Foundries generally continue out of the market and sharp reduction in offering prices is reported with cast quotations largely nominal.

Chicago — "Quote your own price; we'll be glad to sell you the material" could well be the slogan of district scrap dealers for steelmaking grades. The last buying prices for openhearth scrap are so far out of line with prices which could be negotiated that the trade regards them as completely unrelated to a future market.

Cast scrap is in somewhat the same unsettled condition, with some scattered sales made below the prevailing spreads. Higher priced purchases have occurred, but in these cases some special conditions have existed as to quality. Some railroad scrap buying was noted last week, with prices generally off $2 to $4 on the various items. Malleable has nosedived to nominal range of $59 to $60.

St. Louis — Major scrap consumers remain out of the market, dipping into comfortable reserves in the hope another price drop will occur in February. Few orders are open. Tonnage that is on order is moving well, since shippers fear it will be canceled if deliveries are not made promptly. Price level remains uncertain but soft. Inventories at mills and foundries are 60 days or above. One mill's receipts of scrap from sheet customers are better than usual, which allows it to hold out of broker channels.

San Francisco — Prices remain un-

changed on steel grades, but weakness in eastern markets has created an uneasy feeling here. Major mills report ample working supplies and show no tendency to exceed normal stockpiling. Cast iron grades have definitely weaker tendency and little material is moving. Long-range prospects indicate gradual increase in supplies.

Seattle—Increasing volume of steel scrap is arriving at the mills and inventories are beginning to grow. Much tonnage held back for months is being released. A consignment of excellent material has arrived here from the Alaska railroad. Mills have not announced any change in the price of $29 to $30 f.o.b. mill, although a reduction of 50 cents and $1 is in effect at some outports.

Cast iron scrap is ample for current requirements of foundries which report they are paying $40 for truck loads and $45 for car lots of No. 1 cast. Mills are reported to be offering $35, these prices indicating the market's weakness, compared with the $50 level recently in effect.

Canada . . .

Toronto, Ont. — There has been no easing in the more popular lines of steel in Canada, although alloys now are readily attainable. Not much improvement in supplies in the near future is expected unless there is a sharp jump in imports from the United States. Production for 1949 is expected to equal the 1948 record high.

Demand for steel continues well in excess of supply and mills are booked solidly through first quarter. However, reported easing in supply in the United States is expected to bring some relief to this country as there are indications of increased importations, with some interests looking for the improvement in second quarter. However, Canada's defense program will take a large amount of steel that formerly went into ordinary industrial channels, with the result that production of conumer goods may be further curtailed.

Demand for steel plate is expanding steadily with railroad rolling stock builders and agricultural implement makers being favored on deliveries.

Carbon bars are under quota delivery with the supply situation continuing tight. Producers of alloy bars are seeking business in export markets.

With a large part of the pig iron that formerly went to merchant melters now being used in steelmaking operations, foundry interests report difficulty in obtaining supplies.

Algoma Steel Corp., which supplies most of the merchant iron, is quoting base grade, 2.25 silicon and under, $44.50; malleable, $45.50 and basic, $44.50, Sault Ste. Marie, Ont., which brings the Toronto price about $5 per ton above this level.

Scrap receipts by dealers are almost at a standstill. Practically no scrap is reaching dealers or consumers from rural districts and most of the scrap appearing on the market is from industrial plants. Steel scrap continues under price ceiling control, while cast scrap is being picked up by dealers at $44 to $48.

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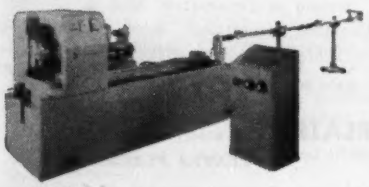

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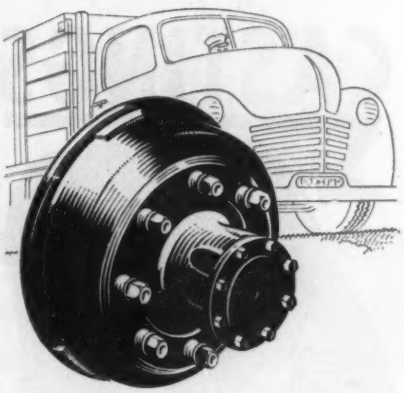

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Tool Steel . . .

Tool Steel Prices, Page 105

Watervliet, N. Y. — Salvage Section, Watervliet Arsenal, will receive bids until 10 a. m., Feb. 16, for sale of 3 lots of surplus property. One lot, having an estimateed cost of $1890.24, consists of 2572 pounds of various grades of tool steels.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

3500 tons, Army Engineer Corps, Bismark, N. Dak., to Truscon Steel Co., Youngstown, O.

2500 tons, apartment, 860 Fifth Avenue Corp., New York, to Harris Structural Steel Co., that city.

1435 tons, superstructure, South Holston river bridge, Tennessee Valley Authority, Knoxville, to Virginia Bridge Co., Roanoke, Va.

1300 tons, addition to municipal power plant, Jamestown, N. Y., to Bethlehem Steel Co.

1085 tons, sodium plant, National Distillers Products Co., Ashtabula, O., to Ingalls Iron Works, Birmingham, Ala.

740 tons, factory building, Research Corp., Bound Brook, N. J., to Bethlehem Steel Co.

600 tons, St. Joseph's hospital, Biddeford, Me., to Grossier & Schlager Iron Works, Somerville, Mass.

425 tons, boiler house, Standard Oil Co. of New Jersey, Bayonne, N. J., through Day & Zimmerman, Philadelphia, to Bethlehem Steel Co.

400 tons, power plant extension, Vienna, Md., to American Bridge Co., Pittsburgh.

400 tons, miscellaneous work for municipal housing, Pelham Parkway, New York, to Empire City Iron Works, that city.

200 tons, state bridge, Biddeford-Saco, Me., to Bethlehem Steel Co., direct.

195 tons, building, Fisher Beer Co., Jersey City, N. J. to Oltmer Iron Works, that city.

175 tons, Jersaleum grade school No. 2, Division Ave., Island Trees, Long Island, to Grand Iron Works, New York.

140 tons, Hewlett School, Hewlett, N. Y., to Grand Iron Works, New York.

120 tons, Factory, Gaybrant Company, South Hackensack, N. J., to Bethlehem Steel Co.

105 tons, addition to Western Electric Co. distribution plant, Atlanta, Ga., to Bethlehem Steel Co.

100 tons, Du Pont power house addition, Belle, W. Va., to Bethlehem Fabricators Inc., Bethlehem, Pa.

STRUCTURAL STEEL PENDING

37,000 tons, including 4000 tons of cable and suspension rope and several hundred tons of other miscellaneous steel items, Delaware River Memorial bridge, near Wilmington, Del.; American Bridge Co., Pittsburgh, low bidder.

8000 tons, unfabricated steel, Yonge St. subway, Toronto Transportation Commission, Toronto, Canada; bids Feb. 2, with delivery in September.

1800 tons, galvanized steel transmission towers; bids to Bonneville Power Administration, Portland, Oreg., Jan. 28; sch. No. 4464.

1500 tons, army warehouses at Fort Richardson and Whittier, Alaska; Henrik Vallee, Seattle, low $1,336,600 and $725,000 respectively.

1500 tons, general accounting offices, Washington; bids Jan. 26.

800 tons, two extra lanes for the Philadelphia-Camden bridge; Kaufmann Construction Co., Philadelphia, low on general contract with a bid of $2,012,000.

500 tons, plant addition, West Vaco Chemical Division, Food Machinery & Chemical Co., Pocatello, Idaho; bids closed Jan. 26 by United Engineers & Constructors, Philadelphia.

495 tons, turbine supports, New England Power Co., Worcester and Salem, Mass.

300 tons, engineering laboratory, Hamilton Watch Co., Lancaster, Pa.; bids Jan. 24.

250 tons, government project in eastern Washington; Isaacson Iron Works, Seattle, low.

250 tons, grain conveyor gallery, Hoosac pier, Port of Boston Authority; bids Feb. 16, Boston.

170 tons, state bridge and underpass, Valley county, Idaho; Hanson & Parr, Spokane, low, $168,813.

160 tons, state highway bridge, Worcester, Mass.; bids in.

125 tons, Children's hospital building, Boston.

100 tons, outlet pipe, spec. 2525, Burlington, Colo.; bids to Bureau of Reclamation, Feb. 3.

100 tons, cable racks for Coulee switchyard; bids in.

REINFORCING BARS . . .

REINFORCING BARS PLACED

200 tons, Yakima, Wash., city hall, to Northwest Steel Rolling Mills Inc., Seattle; John H. Sellen Co., Yakima, general contract, $704,220.

155 tons, warehouse, Westinghouse Electric Supply Co., Boston, to Concrete Steel Co., Boston; Rugo Construction Co., Boston, general contractor.

REINFORCING BARS PENDING

900 tons, west canal, Columbia Basin; bids to Bureau of Reclamation, Mar. 1.

Unstated, department store for Woolworth, Longview, Wash.; Quoidbach Construction Co., Longview, awarded general contract; $300,000 project.

PLATES . . .

PLATES PLACED

100 tons or more, elevated steel water tank for Westport, Wash., to Pittsburgh-Des Moines Steel Co., Pittsburgh, low $35,720.

Unstated, 150-foot lighthouse tender for Canadian government, to Yarrows Ltd., Victoria, B. C.

PLATES PENDING

1400 tons, straight web and standard T sheet piling for McNary dam, Oregon; Bethlehem Pacific Coast Steel Corp., San Francisco, sole bidder.

Unstated, penstock for Gorge power plant; bids to Seattle light department, Feb. 23.

Unstated, caisson for repair of Coulee dam; general contract to Pacific Bridge Co., San Francisco, low, $1,804,840.

PIPE . . .

CAST IRON PIPE PENDING

824 tons, 4 to 12 inch for Seattle water department; H. G. Purcell, Seattle, low for U. S. Pipe & Foundry Co., Burlington, N. J.

RAILS, CARS . . .

RAILROAD CARS PLACED

Detroit & Toledo Shore Line, 125 seventy-ton covered hopper cars, to Greenville Steel Car Co., Greenville, Pa.

Mather Stock Car Co., 50 forty-ton refrigerator cars, to own shops.

Northern Pacific, 500 seventy-ton hopper cars, to Pressed Steel Car Co., Pittsburgh.

RAILROAD CARS PENDING

Chicago North Western, 1000 fifty-ton box cars; bids asked.

Delaware, Lackawanna & Western, 250 to 500 fifty-ton drop-end gondolas; pending.

Northern Pacific, 750 fifty-ton box cars; bids asked.

RAILS PLACED

Florida East Coast, 15,000 net tons, with 13,000 going to the Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., and 2000 to Bethlehem Steel Co.

CONSTRUCTION AND ENTERPRISE

ARKANSAS

FORREST CITY, ARK.—Plans and specifications for a $15 million electric power plant to be erected by Arkansas Power & Light Co., Pine Bluff, Ark., will be prepared by Abasco Services Inc., 2 Rector St., New York, consulting engineer.

CALIFORNIA

SHAFTER, CALIF.—Nikkel Iron Works is firm name under which Albert Nikkel and Jock H. Nikkel have published a certificate to conduct business.

ILLINOIS

AURORA, ILL.—All-Steel Equipment Co., 401 Griffith Ave., has awarded a $240,000 contract for a plant addition to Algot B. Larson, 3837 W. Lake St.; Chicago.

BEDFORD PARK, ILL.—Clark Water Heater Co., division of McGraw Electric Co., Elgin, Ill., plans to build a $250,000 plant; consulting engineer, Sessions Engineering Co., 1 North LaSalle St., Chicago.

BELLWOOD, ILL.—Chicago Screw Co., 1026 S. Homan St., has awarded a $4 million contract to George Sollitt Construction Co., 109 N. Dearborn St., for erection of a factory.

CHICAGO—B. A. Railton Co., 363 W. Erie St., has awarded a $350,000 contract for erection of a plant to Sumner S. Sollitt Co., 307 N. Michigan Ave.

CHICAGO—James Lees & Sons has awarded a $300,000 general contract to Clearing Industrial Dist. Inc., 6455 S. Central Ave., for construction of a warehouse and office; J. S. Cromelin, architect.

CHICAGO—Shotwell Mfg. Co., 3501 W. Potomac St., has awarded a $300,000 general contract to W. H. Lyman Construction Co., 134 N. LaSalle St., for construction of a factory addition.

CHICAGO—Perkins Products Co., 5555 W. 65th St., has awarded a $750,000 contract to Algot B. Larsons Inc., 3837 W. Lake St., for erection of a factory; Sessions Engineering Co., 1 N. LaSalle St., engineer.

CHICAGO—Sunbeam Corp., 5600 W. Roosevelt Rd., has awarded a $900,000 contract to Campbell, Lowrie, Lautermilch Corp., 400 W. Madison St., for construction of a factory; Olsen & Urbain, 5 South Wabash Ave., architect.

CICERO, ILL.—Pheell Manufacturing Co., 5700 West Roosevelt Rd., has awarded a $700,000 contract to Campbell, Lowrie Lautermilch Corp., 400 West Madison St., Chicago, for construction of a plant to be located at 31st St. and Ogden Ave.; Olsen and Urbain, 5 South Wabash Ave., Chicago, architect.

KENTUCKY

JUNCTION CITY, KY. — Kraemer Veneer Plant, c/o Ross Kraemer, has awarded separate contracts totalling $1.5 million for a plant to replace Burnside Veneer plant; L. V. Abott, 2323 S. Brook St., Louisville, architect.

MICHIGAN

WILLOW RUN—Kaiser Frazer Corp., has awarded a $1,090,000 contract to Edwin E. Hartrich & Son, 141 W. Jackson Blvd., Chicago, for construction of an auto parts warehouse; Albert Eiseman, 141 W. Jackson Blvd., Chicago, architect.

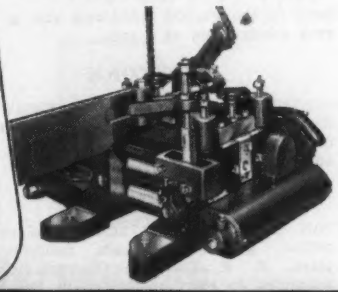
MINNESOTA

TWIN LAKES, MINN.—Dairyland Power Cooperative, 407 Rivoli Bldg., La Crosse, Wis., will let contract for $1 million plant; Ellerbe & Co., E. 505 First National Bank Bldg., St. Paul, engineer.

MONTANA

SUPERIOR, MONT.—Coeur d'Alene Mines Extension Co. has opened the only fluorspar

Assures Fast—Safe—Accurate Feeding of Coiled Strip Stock



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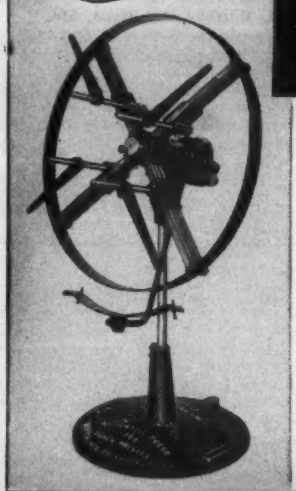

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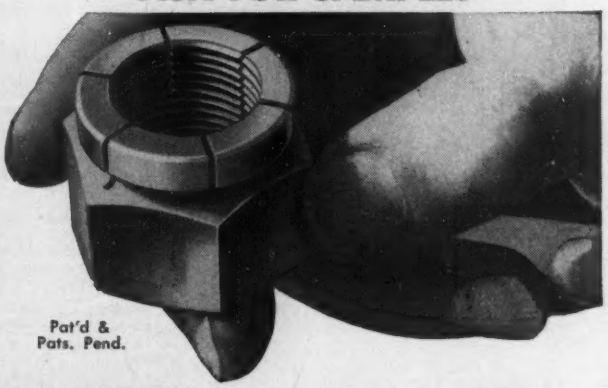

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mine in the Pacific Northwest and is planning construction of a mill.

NEW YORK

ROCHESTER, N. Y.—Eastman Kodak Co., Kodak Park, has awarded a $628,000 contract, own forces, for erection of a plant addition.

OHIO

AVON LAKE, O.—First unit of the new $3 million general chemicals manufacturing plant, B. F. Goodrich Chemical Co., is scheduled to start operations in the second quarter of this year.

CLEVELAND—Kinsley Chemical Co., 4538 W. 130th St., is planning a $500,000 plant addition.

CLEVELAND—Formation of Affiliated Gas Equipment Inc. has been completed. The new organization represents combining in one unit of the following firms, formerly subsidiaries of Dresser Inc.: Bryant Heater Co., Cleveland; Day & Night Mfg. Co., Monrovia, Calif; Payne Furnace Co., Beverly Hills, Calif.

ELYRIA, O.—Brown-Lipe-Chapin Division of General Motors Corp., manufacturer of automobile accessories, will move its Syracuse, N. Y., operations here as soon as it is practicable; George S. Cole Jr. is manager of the Elyria plant.

YOUNGSTOWN—Master Alloys Inc. has been formed to manufacture and deal in nickel alloys. Incorporators are Joseph H. Persky, Samuel K. Walzer and H. T. McCune. Maurice A. Young, 310 North Ave., acted as statutory agent.

OKLAHOMA

CUSHING, OKLA.—Shell Pipeline Co. has awarded a $500,000 contract to Johnson Construction Co., Phelps Grove, Mo., for construction of pumphouses to be erected at Diamond, Buffalo and Bland, Mo.

OREGON

PORTLAND, OREG.—O. E. Walsh, U. S. engineer, has called bids for a $20 million main structure of Detroit gravity dam, part of a $65 million project.

PENNSYLVANIA

NEW CASTLE, PA.—Bossert Co., subsidiary, Timken-Detroit Axle Co., has completed negotiations for purchase of the war surplus Aluminum Co. plant for $1,150,000.

SELLERSVILLE — Schulmerich Electronics Inc., c/o Frank M. Bates Asso., engineer, N. Radcliffe St., Bristol, has awarded a $200,000 contract to Ike Heckler Jr., Funk Rd., Lansdale, for erection of a factory and office.

WEST MIFFLIN—Continental Can Co., 100 East 42nd St., New York, has awarded a $1.5 million contract to Wigton Abbott Corp., 1225 South Ave., Plainfield, N. J., for erection of a plant.

TEXAS

AMARILLO, TEX.—Star Mfg. Co. is building a $250,000 plant near Turner, Kans., on a site between Amarillo and Turner in the Santa Fe Railroad's new industrial development area on the Kansas River.

DALLAS, TEX.—Huey & Philps, 1102 Pacific St. has awarded a contract to Meers Construction Co., Great National Life Bldg., for construction of a $156,000 factory, and $200,000 warehouse addition.

PRICES OF LEADING FERROALLOYS PRODUCTS

(*Continued from Page* 107)

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 18.5c per lb of contained Si; packed 19.90c; ton lots 21.00c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 11.3c per lb of contained Si, carload packed 12.9c, ton lot 14.35c, less ton 16c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 13.5c per lb of contained Si, carload packed 14.8c, ton lot 15.95c, less ton 17.2c. Delivered. Spot, add 0.8c.

80-90% Ferrosilicon: Contract, carload, lump, bulk 14.65-15c per lb of contained Si, carload packed 15.9c, ton lot 16.9c, less ton 18.05c. Delivered. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 16.5c per lb of contained Si, carload packed 17.7c, ton lot 18.65c, less ton 19.7c. Delivered. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Add 0.7c to above 90-95% ferrosilicon prices.

Silicon Metal: (Min. 97% Si and 1% max. Fe.). C.l., lump, bulk, regular 19.0c per lb of Si c.l. packed 20.2c, ton lot 21.1c, less ton 22.1c. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max 2% Fe grade analyzing min. 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 8.90c per lb of alloy, ton lots packed 10.3c, 200 to 1999 lb 10.65c, smaller lots 11.15c. Delivered. Spot up 0.5c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 13.75c per lb of briquet, carload packed 14.45c, ton lot 15.25c, less ton 16.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk, 10.00c per lb of briquet, c.l. packaged 10.8c, ton lot 11.6c, less ton 12.5c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 10.0c, per lb of briquet, c.l. packed 10.8c, ton lot 11.6c, less ton 12.5c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.15c per lb of briquet, c.l. packed 6.95c, ton lot 7.75c, less ton 8.65c. Delivered. Spot, add 0.25c.

(Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.30c, c.l. packed 7.10c, ton lots 7.90c, less ton 8.80c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) 95.00c per pound of Mo contained. F.o.b. Langeloth, Pa.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18%, and Si 53-59%). Contract, carload, lump, bulk 19.25c per lb of alloy, carload packed 20.05c, ton lot 21.55c less ton 22.55c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 17.9c per lb of alloy, carload packed 19.1c, ton lot 21.0c, less ton 22.5c. Delivered. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max., Si 4% max., C 0.10% max.). Contract, ton lots, 2" x D, $1.40 per lb of contained Ti; less ton $1.45. (Ti 38-43%, Al 8% max., Si 4% max., C 0.10% max.). Ton lot $1.28, less ton $1.35. F.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract, $160 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: Ti 17-21%, C 3-4.5%). Contract, $175 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

VANADIUM ALLOYS

Ferrovanadium: Open-Hearth Grade (Va 35-55%, Si 8-12% max., C 3-3.5% max.). Contract, any quantity, $2.90 per lb of contained Va. Delivered. Spot, add 10c. **Crucible-Special Grades** (Va 35-55%, Si 2-3.5% max., C 0.5-1% max.), $3. **Primos and High Speed Grades** (Va 35-55%, Si 1.50% max., C 0.20% max.), $3.10.

Vanadium Oxide: Contract, less carload lots, $1.20 per lb of contained V_2O_5, freight allowed. Spot, add 5c.

Grainal: Vanadium Grainal No. 1, 93c; No. 6, 63c; No. 79, 45c, freight allowed.

TUNGSTEN ALLOYS

Ferrotungsten: (W 70-80%). Contract, 10,000 lb W or more, $2.25 per lb of contained W; 2000 lb W to 10,000 lb W, $2.35; less than 2000 lb W, $2.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Contract or spot, 1000 lb or more, $2.90 per lb of contained W; less than 1000 lb W, $3.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloys: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Contract, c.l., lump, bulk 6.6c per lb of alloy, c.l. packed 7.35c, ton lot 8.1c, less ton 8.95c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Contract, 100 lb or more. 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered. Spot, add 5c.

Borosil: (3 to 4% B, 40 to 45% Si), $6.25 per lb contained B, f.o.b. Philo, O., freight not exceeding St. Louis rate allowed.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 0.90 to 1.15%). Net ton to carload, 8c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Mn 5% max., Si 8% max., C 0.5% max.). Contract, ton lot, 2" x D, $2.90 per lb of contained Cb, less ton $2.95. Delivered. Spot, add 25c.

CMSZ Mixes: (No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 0.75-1.25%, C 3.50-5%). Carload, 12 M x D, carload packed 19.0c per lb of material, ton lot 19.75c, less ton 21.0c. Delivered.

Silcaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, Boron 0.55-0.75%). Carload packed, 1" x D, 43c per lb of alloy, ton lot 45c, less ton 47c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Contract, carload, packed, ¼" x 12 M, 16.5c per lb of alloy, ton lots 17.25c, less ton 18.5c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 16.50-17.00c per lb of alloy; ton lots 17.90-18.00c; less ton lots 19.40-19.50c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed, 14.25c per lb of alloy; ton lots 15.75c; less ton lots 17.00c, f.o.b., Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al). Packed, lump, carload 11c, ton lots 11.25c, smaller lots 11.75c per lb alloy; freight not exceeding St. Louis rate allowed.

Ferrophosphorus (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base): Gross tons per carload, f.o.b. sellers' works, Mt. Pleasant, or Siglo, Tenn.; $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, contained Mo, f.o.b. Langeloth and Washington, Pa., furnace, any quantity $1.10.

Technical Molybdic-Oxide: Per lb, contained Mo, f.o.b. Langeloth, Pa., packed in bags containing 20 lb of molybdenum, 95.00c.